Statement of Basis

Permit to Construct No. P-2016.0006
Project ID 62178

CD'A Redi Mix
Post Falls, Idaho

Facility ID 055-00125

Final

April 9, 2019
Kelli Wetzel KW
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
Btu	British thermal units
CAA	Clean Air Act
CAS No.	Chemical Abstracts Service registry number
CBP	concrete batch plant
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GACT	Generally Available Control Technology
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
HMA	hot mix asphalt
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
iwg	inches of water gauge
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter

ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

CD'A Redi Mix is an existing, permitted stationary truck mix concrete batch plant consisting of aggregate stockpiles, two cement storage silos, a cement supplement (fly ash) storage silo, a weigh batcher, and conveyors. The facility combines aggregate, sand, fly ash, and cement and then transfers the mixture into a truck mixer, along with water, for in-transit mixing of the concrete. In addition, water heater(s) are used to heat the water in cold weather prior to use for the mixing of concrete.

The concrete batch plant is fed a mixture of aggregates from imported aggregate.

The process begins with materials being fed via front end loader to a compartment bin feeder system and then dispensed in metered proportions to a collecting conveyor. The material passes over a scalping screen before being conveyed into the truck mixer.

Particulate emissions are controlled by maintaining the moisture content at 1.5% by weight for all ¼ in and smaller aggregate feed materials via water sprays.

There are concrete production rate throughput limits of 220 cubic yards per hour, 1,500 cubic yards per day, and 100,000 cubic yards per year.

Line power is used exclusively at the facility. Therefore, no IC engines powering electrical generators are included.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

July 8, 2016	P-2016.0006, Initial PTC for a stationary concrete batch plant facility, Permit status (S)
April 3, 2018	P-2016.0006, Modified PTC to add a baghouse on the weigh batch and truck load out and install an additional baghouse to control a third silo, Permit status (A, but will become S upon issuance of this permit)

Application Scope

This PTC is for a minor modification at an existing minor facility.

The applicant has proposed to:

- Install and operate an additional truck mix concrete batch plant identical to the existing concrete batch plant except it will have no water heater; and
- Install and operate a hot mix asphalt plant adjacent to the current plant.

Application Chronology

February 5, 2019	DEQ received an application and an application fee.
February 8 – February 25, 2019	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
February 20, 2019	DEQ determined that the application was complete.
March 22, 2019	DEQ made available the draft permit and statement of basis for peer and regional office review.
March 27, 2019	DEQ made available the draft permit and statement of basis for applicant review.
April 5, 2019	DEQ received the permit processing fee.

April 9, 2019 DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment	Emission Point ID No.
Materials Handling	Material Transfer Points: Materials handling Concrete aggregate transfers Truck unloading of aggregate Aggregate conveyor transfers Aggregate handling	Maintaining the moisture content in ¼" or smaller aggregate material at 1.5% by weight, using water sprays, using shrouds, or other emissions controls	N/A
Concrete Mixer	Concrete Batch Plant – Truck Mix No. 1: Manufacturer: Con-E-Co Model: Lo-Pro 12 Manufacture Date: Unknown Max. production: 220 yd^3/hr, 1,500 yd^3/day, and 100,000 yd^3/yr Cement Storage Silo: Baghouse Manufacturer[(a)]: Con-E-Co Model: PJC-3005 Second Cement Storage Silo: Baghouse Manufacturer[(a)]: Con-E-Co Model: PJ-3005 Fly Ash Storage Silo: Baghouse Manufacturer[(a)]: Con-E-Co Model: PJ-3005	Weigh Batcher Baghouse: Manufacturer: Con-E-Co Model: BV-14 $PM_{10}/PM_{2.5}$ control efficiency: 99% Cement Storage Silo Baghouse: Manufacturer: Con-E-Co Model: PJC-3005 Second Cement Storage Silo Baghouse: Manufacturer: Belgrade Steel Tank Co. Model: Belle 225 Cement Supplement Silo Baghouse: Manufacturer: Con-E-Co Model: PJ-3005 Truck Load out Baghouse Manufacturer: Con-E-Co Model: PJ-980D Control: Baghouse $PM_{10}/PM_{2.5}$ control efficiency: 99% Material Transfer Points: $PM_{10}/PM_{2.5}$ control efficiency: 75%	Weigh Batcher Baghouse Exhaust: Exit height: 21 ft (6.4 m) Exit diameter: 0.65 ft (20 m) Exit flow rate: 180 acfm Exit temperature: ambient Cement Storage Silo Baghouse Exhaust: Exit height: 32 ft (9.76 m) Exit diameter: 0.92 ft (0.28 m) Exit flow rate: 850 acfm Exit temperature: ambient Second Cement Storage Silo Bin Vent Filter/Baghouse Exhaust: Exit height: 60 ft (18.3 m) Exit diameter: 0.92 ft (0.28 m) Exit flow rate: 675 acfm Exit temperature: ambient Cement Supplement Silo Baghouse Exhaust: Exit height: 51 ft (15.5 m) Exit diameter: 0.92 ft (0.28 m) Exit flow rate: 850 acfm Exit temperature: ambient Truck Load-out Baghouse Exhaust: Exit height: 45 ft (13.7 m) Exit diameter: 0.49 ft (0.15 m) Exit flow rate: 5880 acfm Exit temperature: ambient
Concrete Mixer	Concrete Batch Plant – Truck Mix No. 2: Manufacturer: Con-E-Co Model: Lo-Pro 12 Manufacture Date: Unknown Max. production: 220 yd^3/hr, 750 yd^3/day, and 75,000 yd^3/yr Cement Storage Silo: Baghouse Manufacturer[(a)]: Con-E-Co Model: PJC-3005	Weigh Batcher Baghouse: Manufacturer: Con-E-Co Model: BV-14 $PM_{10}/PM_{2.5}$ control efficiency: 99% Cement Storage Silo Baghouse: Manufacturer: Con-E-Co Model: PJC-3005 Second Cement Storage Silo Baghouse: Manufacturer: Belgrade Steel Tank Co. Model: Belle 225	Weigh Batcher Baghouse Exhaust: Exit height: 21 ft (6.4 m) Exit diameter: 0.65 ft (20 m) Exit flow rate: 180 acfm Exit temperature: ambient Cement Storage Silo Baghouse Exhaust: Exit height: 32 ft (9.76 m) Exit diameter: 0.92 ft (0.28 m) Exit flow rate: 850 acfm Exit temperature: ambient

	Second Cement Storage Silo: Baghouse Manufacturer[a]: Con-E-Co Model: PJ-3005 Fly Ash Storage Silo: Baghouse Manufacturer[a]: Con-E-Co Model: PJ-3005	Cement Supplement Silo Baghouse: Manufacturer: Con-E-Co Model: PJ-3005 Truck Load out Baghouse Manufacturer: Con-E-Co Model: PJ-980D Control: Baghouse $PM_{10}/PM_{2.5}$ control efficiency: 99% Material Transfer Points: $PM_{10}/PM_{2.5}$ control efficiency: 75%	Second Cement Storage Silo Bin Vent Filter/Baghouse Exhaust: Exit height: 60 ft (18.3 m) Exit diameter: 0.92 ft (0.28 m) Exit flow rate: 675 acfm Exit temperature: ambient Cement Supplement Silo Baghouse Exhaust: Exit height: 51 ft (15.5 m) Exit diameter: 0.92 ft (0.28 m) Exit flow rate: 850 acfm Exit temperature: ambient Truck Load-out Baghouse Exhaust: Exit height: 45 ft (13.7 m) Exit diameter: 0.49 ft (0.15 m) Exit flow rate: 5880 acfm Exit temperature: ambient
Water Heater	Water Heater: Manufacturer: Unknown Model: Unknown Manufacture Date: Unknown Heat input rating: 2.76 MMBtu/hr Fuel: Propane	N/A	
Hot Mix Asphalt Drum Mixer	Asphalt Drum Mixer: Manufacturer: TBD Model: TBD Type: Counter-flow Manufacture Date: TBD Max. production: 350 T/hr, 3,500 T/day, and 150,000 T/yr Fuel(s): Natural gas Sulfur content: 0.0015% by weight	Asphalt Drum Mixer Baghouse: Manufacturer: Asphalt Drum Mixers, Inc. Model: RA896 Type: Reverse pulse-jet Flow rate: 53,159 dscf PM_{10} control efficiency: 99.83%	Exit height: 30 ft (9.1 m) Exit diameter: 4 ft (1.2 m) Exit flow rate: 50000 acfm Exit temperature: 260 °F (127 °C)
Asphaltic Oil Tank Heater	Asphaltic Oil Tank Heater: Heat input rating: 1.8 MMBtu/hr Fuel(s): Natural gas Sulfur content: 0.0015% by weight	N/A	Exit height: 15 ft (4.6 m) Exit diameter: 1 ft (0.3 m) Exit flow rate: 100 acfm Exit temperature: 400 °F (204 °C)

a) Both the storage silo baghouse and supplement storage silo flyash baghouse are considered process equipment and therefore there is no associated control efficiency. Controlled PM_{10} emission factors were used when determining PTE and for modeling purposes.

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the second concrete batch plant operations at the facility associated with this proposed project using the DEQ developed CBP EI spreadsheet (see Appendix A). An additional emission inventory was developed for the asphalt production operations at the facility associated with this proposed project using the DEQ developed HMA EI spreadsheet (see Appendix A).Emissions estimates of criteria pollutant PTE were based on the following assumptions for both the second CBP and HMA:

- Maximum concrete throughput does not exceed 220 yd^3/hour, 750 yd^3/day, and 75,000 yd^3/year at the new concrete batch plant (per the Applicant).

- Maximum asphalt throughput does not exceed 350 ton HMA/hour, 3,500 ton HMA/day, and 150,000 ton HMA/year (per the Applicant).Baghouse/cartridge filter control efficiencies were assumed to be 99.0%.
- Emissions from the asphalt drum dryer were based on the maximum emissions from using any of the proposed fuels for combustion in the drum dryer.
- Any emissions unit outside a 1,000 ft radius from the asphalt plant was not included in the emissions modeling analysis for this project.
- Fugitive emissions of particulate matter (PM), PM_{10}, and $PM_{2.5}$ from the concrete batch plant material transfer points were assumed to be controlled by manual water sprays, sprinklers, or spray bars, or an equivalent method that reduce PM emissions by an estimated 75%. The assumed 75% control efficiency is based on the Western Regional Air Partnership Fugitive Dust Handbook. According to the Handbook, water suppressant of material handling can range from 50-90% control. Assuming the average of 70% and including another 5% due to Best Management Practices required by the permit allow for 75% control to be a conservative estimate.
- Aggregate is washed before delivery to the concrete batch plant site, and water is used on-site to control the temperature of the aggregate. Particulate matter and PM_{10} emissions from the weigh batcher transfer point are controlled by a baghouse/cartridge filter, and truck mix load-out emissions are controlled by a boot. Capture efficiency of the truck mix load-out baghouse or equivalent was estimated at 99%.
- Controlled emissions of particulate toxic air pollutants (TAPs) were estimated based on the presence of bin vent filters/baghouse controlling emissions from the cement/cement supplement silos, a baghouse controlling emissions from the weigh batcher, and 99% control for truck load-out emissions. Hexavalent chromium content was estimated at 20% of total chromium for cement, and 30% of total chromium for the cement supplement/fly ash. The hexavalent chromium percentages were taken from a University of North Dakota study, by the Energy and Environmental Research Center, Center for Air Toxic Metals. Detailed emissions calculations can be found in Appendix A of this document.
- Determining emissions from a concrete batch plant also includes transfer emissions from the number of drop points throughout the process. The PM_{10} emissions from truck-mix loading operations are defined by an equation which includes the wind speed at each drop point and the moisture content of cement and cement supplement and a number of exponents and constants defined by AP-42 Equation 11.12-1 (6/06). An average value of wind speed and moisture content are 7 mph, 4.17%, and 1.77%, respectively[1]. The following equation of particulate emissions is specific to PM_{10}. The resulting emissions were used to determine a factor to help evaluate wind speed variations in AERMOD modeling.

$$E = k(0.0032) * \left[\frac{U^a}{M^b} \right] + c$$

Where:
k = particle size multiplier
a = exponent
b = exponent
c = constant
U = mean wind speed
M = moisture content

[1] 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO). 4.17 % and 1.77% were the average percentages for sand and aggregate respectively. These values are based on EPA tests conducted at Cheney Enterprises. The percentages used in AP-42 are typical for most concrete batching operations.

- The second transfer emissions calculations were used to determine conveyor emissions. For both coarse and fine aggregate to a conveyor. It was assumed that 82%, which for this facility is 180 yd^3/hr (0.82 x 220 yd^3/hr), of the concrete produced was aggregate. This percentage was based on 1,865 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for a total of 4,024 lb concrete as defined by AP-42 Table 11.12-5 (06/06). The fine and coarse aggregate contributions were separated into 36% and 46% of the total concrete production[2]. Employing emission factors from AP-42 Table 11.12-5 (6/06) for conveyor transfer and assuming 75% control efficiency as stated earlier for conveyor transfer PM_{10} emissions were calculated for each transfer point. For both fine and coarse aggregate the facility has 3 transfer points.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Concrete batch plant[(c)]	0.068	0.015	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A
Water heater	0.024	0.015	0.045	0.028	0.452	0.283	0.253	0.158	0.033	0.021
Materials handling	0.24	0.19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pre-Project Totals	**0.33**	**0.22**	**0.04**	**0.03**	**0.45**	**0.28**	**0.25**	**0.16**	**0.03**	**0.02**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) $PM_{10}/PM_{2.5}$ emissions from the concrete batch loadout are considered fugitive emissions and are therefore not included in the Potential to Emit.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Concrete batch plant No. 1[(c)]	0.068	0.015	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A
Water heater	0.024	0.015	0.045	0.028	0.452	0.283	0.253	0.158	0.033	0.021
Materials handling	0.99	0.66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
New concrete batch plant No. 2[(c)]	0.03	0.01	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A
Asphalt drum mixer	8.05	1.73	1.19	0.26	9.10	1.95	45.50	9.75	11.20	2.40
Asphaltic oil tank heater	0.01	0.03	0.001	0.002	0.18	0.35	0.15	0.30	0.01	0.02
Load-out and silo filling	0.39	0.08	N/A	N/A	N/A	N/A	0.89	0.19	1.41	0.30
Post Project Totals	**9.56**	**2.54**	**1.19**	**0.26**	**9.28**	**2.30**	**46.54**	**10.24**	**12.62**	**2.72**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) $PM_{10}/PM_{2.5}$ emissions from the concrete batch loadout are considered fugitive emissions and are therefore not included in the Potential to Emit.

[2] The percentages of coarse and fine aggregate are based on the AP-42 concrete composition. One cubic yard of concrete as defined by AP-42 is 4024 total pounds. Similarly, coarse aggregate is 1865 pounds or 46% of the total and sand (fine) aggregate is 1428 pounds or 36%.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	0.33	0.22	0.04	0.03	0.45	0.28	0.25	0.16	0.03	0.02
Post Project Potential to Emit	9.56	2.54	1.19	0.26	9.28	2.30	46.54	10.24	12.62	2.72
Changes in Potential to Emit	**9.23**	**2.32**	**1.15**	**0.23**	**8.83**	**2.02**	**46.29**	**10.08**	**12.59**	**2.70**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of non-carcinogenic toxic air pollutants (TAP) is provided in the following table.

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 5 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetone	0.00E-03	1.26E-03	1.26E-03	119	No
Antimony	0.00E-03	2.63E-05	2.63E-05	0.033	No
Barium	0.00E-03	8.48E-04	8.48E-04	2	No
Carbon disulfide	0.00E-03	3.63E-04	3.63E-04	0.033	No
Chromium metal (II and III)	2.12E-05	8.35E-04	8.14E-04	0.033	No
Cobalt metal dust, and fume	0.00E-03	3.84E-06	3.84E-06	0.0033	No
Copper (fume)	0.00E-03	4.53E-04	4.53E-04	0.013	No
Cumene	0.00E-03	6.67E-04	6.67E-04	16.3	No
Ethyl benzene	0.00E-03	3.74E-02	3.74E-02	29	No
Ethyl chloride (Chloroethane)	0.00E-03	7.24E-05	7.24E-05	176	No
Heptane	0.00E-03	1.37E+00	1.37E+00	109	No
Hexane	0.00E-03	1.38E-01	1.38E-01	12	No
Manganese as Mn (fume)	1.65E-05	1.14E-03	1.12E-03	0.067	No
Mercury (alkyl compounds as Hg)	0.00E-03	3.50E-05	3.50E-05	0.001	No
Methyl bromide	0.00E-03	1.45E-04	1.45E-04	1.27	No
Methyl chloride (Chloromethane)	0.00E-03	5.00E-04	5.00E-04	6.867	No
Methyl chloroform	0.00E-03	7.00E-03	7.00E-03	127	No
Methyl ethyl ketone (MEK)	0.00E-03	9.90E-04	9.90E-04	39.3	No
Molybdenum (soluble)	0.00E-03	6.47E-07	6.47E-07	0.333	No
Pentane	0.00E-03	1.53E-03	1.53E-03	118	No
Phenol	0.00E-03	5.87E-04	5.87E-04	1.27	No
Phosphorous	6.11E-05	4.17E-03	4.11E-03	0.007	Yes
Selenium	6.27E-07	5.19E-05	5.13E-05	0.013	No

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Silver as Ag (soluble)	0.00E-03	7.00E-05	7.00E-05	0.001	No
Styrene monomer	0.00E-03	1.40E-04	1.40E-04	6.67	No
Thallium	0.00E-03	5.98E-07	5.98E-07	0.007	No
Toluene	0.00E-03	2.43E-02	2.43E-02	25	No
Vanadium as V_2O_5, (respirable dust and fume)	0.00E-03	1.35E-06	1.35E-06	0.003	No
Xylene	0.00E-03	4.11E-02	4.11E-02	29	No
Zinc metal	0.00E-03	8.90E-03	8.90E-03	0.667	No

Some of the changes in emissions rates for non-carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for phosphorus because the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Arsenic	8.21E-07	1.11E-05	1.03E-05	1.5E-06	Yes
Benzene	0.00E-03	6.78E-03	6.78E-03	8.0E-04	Yes
Beryllium and compounds	4.69E-08	9.18E-08	4.49E-08	2.8E-05	No
Cadmium and compounds	6.57E-07	9.06E-06	8.40E-06	3.7E-06	Yes
Chromium (VI)	2.47E-07	8.14E-06	7.89E-06	5.6E-07	Yes
Formaldehyde	0.00E-03	5.46E-02	5.46E-02	5.1E-04	Yes
Nickel	1.45E-06	1.08E-03	1.08E-03	2.7E-05	Yes
PAHs Total	0.00E-03	4.03E-03	4.03E-03	9.1E-05	Yes
POM Total[a]	0.00E-03	2.88E-05	2.88E-05	2.0E-06	Yes
Tetrachloroethylene	0.00E-03	4.67E-05	4.67E-05	1.3E-02	No

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for arsenic, benzene, cadmium, chromium (VI), formaldehyde, nickel, and POM because the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded. Note: Even though the PAHs screening level was exceeded, PAHs are not required to be modeled because of the constituents that make up the PAH total, no one toxic included in this total exceeded its corresponding EL.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 7 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

IDAPA Listing	Hazardous Air Pollutants	PTE (T/yr)
	Antimony	1.35E-05
	Barium	4.51E-04
	Chromium	4.24E-04
	Cobalt	2.25E-06
	Copper	2.36E-04
	Ethyl benzene	1.80E-02
	Hexane	7.54E-02
	Manganese	5.96E-04
	Methyl chloroform	3.60E-03
	Molybdenum	3.88E-06
	Naphthalene	6.75E-03
	Pentane	1.58E-02
	Phosphorus	2.12E-03
	Selenium	2.72E-05
	Silver	3.60E-05
	Thallium	3.08E-07
	Toluene	1.13E-02
	Vanadium	8.12E-06
	Xylene	1.50E-02
	Zinc	4.58E-03
586	Arsenic	4.90E-05
	Benzene	2.93E-02
	Benzo(a)anthracene	1.58E-05
	Benzo(a)pyrene	7.39E-07
	Benzo(b)fluoranthene	7.51E-06
	Benzo(k)fluoranthene	3.08E-06
	Beryllium	4.01E-07
	Cadmium	3.96E-05
	Chrysene	1.35E-05
	Dibenzo(a,h)anthracene	4.24E-09
	Formaldehyde	2.33E-01
	Hexavalent Chromium	3.57E-05
	Indeno(1,2,3-cd)pyrene	5.31E-07
	3-Methylchloranthrene	6.35E-09
	Nickel	4.74E-03
Not listed	Acenaphthene	1.05E-04
	Acenaphthylene	6.45E-04
	Anthracene	1.65E-05
	Benzo(e)pyrene	8.25E-06
	Benzo(g,h,I)perylene	3.00E-06
	Dichlorobenzene	4.24E-06
	Fluoranthene	4.58E-05
	Fluorene	2.85E-04
	Isooctane	3.00E-03
	Mercury	1.80E-05
	2-Methylnaphthalene	5.55E-03
	Perylene	6.60E-07
	Phenanthrene	5.70E-04
	Pyrene	4.05E-05
	Total	**0.432**

The estimated PTE for all federally listed HAPs combined is below 25 T/yr and no PTE for a federally listed HAP exceeds 10 T/yr. Therefore, this facility is not a Major Source for HAPs.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of PM_{10}, $PM_{2.5}$, CO, and TAPs from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[3]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix A.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

As a result of the ambient air quality impact analysis, as well as information submitted by the Applicant for specific operating scenarios, the following conditions (along with corresponding monitoring and record keeping requirements) were placed in the permit:

- The Emissions Limits permit condition.
- The Concrete Production Limits permit condition.
- The Asphalt Production Limits permit condition.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Kootenai County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

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[3] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 8 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	< 100	2.54	**100**	B
PM_{10}	< 100	2.54	**100**	B
$PM_{2.5}$	< 100	2.54	**100**	B
SO_2	0.26	0.26	**100**	B
NO_X	2.30	2.30	**100**	B
CO	10.24	10.24	**100**	B
VOC	2.72	2.72	**100**	B
HAP (single)	0.23	0.23	**10**	B
Total HAPs	0.43	0.43	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 ..... Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 ..... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 3.4 and 4.5.

Fugitive Emissions (IDAPA 58.01.01.650)

IDAPA 58.01.01.650..... Rules for the Control of Fugitive Emissions

The sources of fugitive emissions at this facility are subject to the State of Idaho fugitive emissions standards. These requirements are assured by Permit Conditions 2.1, 2.2, 2.4, and 2.6.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 ..... Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979, and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following equations:

IDAPA 58.01.01.701.01.a: If PW is $< 9{,}250$ lb/hr; $E = 0.045\ (PW)^{0.60}$

IDAPA 58.01.01.701.01.b: If PW is $\geq 9{,}250$ lb/hr; $E = 1.10\ (PW)^{0.25}$

For equipment that commenced prior to October 1, 1979, the PM allowable emission rate is based on one of the following equations:

IDAPA 58.01.01.702.01.a: If PW is $< 17{,}000$ lb/hr; $E = 0.045\ (PW)^{0.60}$

IDAPA 58.01.01.702.01.b: If PW is $\geq 17{,}000$ lb/hr; $E = 1.12\ (PW)^{0.27}$

As discussed previously in the Emissions Inventory Section, concrete has a density of 4,024 lb per cubic yard. Thus, for the new Concrete Batch Plant proposed to be installed as a result of this project with a proposed throughput of 220 y^3/hr, E is calculated as follows:

Proposed throughput = 4,024 lb per cubic yard x 220 y^3/hr = 885,280 lb/hr

Therefore, E is calculated as:

$E = 1.10 \times PW^{0.25} = 1.10 \times (885{,}280)^{0.25} = 33.74$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 0.03 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 0.06 lb-PM/hr (0.03 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

Rules for Control of Odors (IDAPA 58.01.01.775)

IDAPA 58.01.01.750..... Rules for Control of Odors

Section 776.01 states that no person shall allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids into the atmosphere in such quantities as to cause air pollution. These requirements are assured by Permit Conditions 2.3 and 2.8.

Rules for Control of Hot-Mix Asphalt Plants (IDAPA 58.01.01.805)

IDAPA 58.01.01.805..... Rules for Control of Hot-Mix Asphalt Plants

The purpose of Sections 805 through 808 is to establish for hot-mix asphalt plants restrictions on the emission of particulate matter.

Section 806 states that no person shall cause, allow or permit a hot-mix asphalt plant to have particulate emissions which exceed the limits specified in Sections 700 through 703. As demonstrated previously, these requirements have been met by the proposed PM_{10} emissions rate (see Section on Particulate Matter – New Equipment Process Weight Limitations).

Section 807 states that in the case of more than one stack to a hot-mix asphalt plant, the emission limitation will be based on the total emission from all stacks. The proposed facility only has one stack for emissions from the asphalt drum dryer so there is no need to combine emissions limits from multiple stacks into one stack as required.

Section 808.01 requires fugitive emission controls as follows: No person shall cause, allow or permit a plant to operate that is not equipped with an efficient fugitive dust control system. The system shall be operated and maintained in such a manner as to satisfactorily control the emission of particulate material from any point other than the stack outlet.

Section 808.02 requires plant property dust controls as follows: The owner or operator of the plant shall maintain fugitive dust control of the plant premises and plant owned, leased or controlled access roads by paving, oil treatment or other suitable measures. Good operating practices, including water spraying or other suitable measures, shall be employed to prevent dust generation and atmospheric entrainment during operations such as stockpiling, screen changing and general maintenance.

These requirements are assured by Permit Conditions 2.1 and 2.2.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 ..... Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for all criteria pollutants or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 ..... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

Because the facility produces asphalt the following NSPS Subpart are applicable:

- 40 CFR 60, Subpart I - National Standards of Performance for Hot Mix Asphalt Plants

DEQ has been delegated authority to this subpart.

40 CFR 60, Subpart I..... National Standards of Performance for Hot Mix Asphalt Plants

This permitting action is for a new asphalt plant. Therefore, the requirements of this subpart may apply.

§ 60.90.....Applicability and designation of affected facility

In accordance with §60.90(a), each hot mix asphalt facility is an affected facility. In accordance with §60.90(b), any hot mix asphalt facility that commences construction or modification after June 11, 1973 is subject to the requirements of Subpart I.

The affected facility includes: the dryer; systems for screening, handling, storing, and weighing hot aggregate; systems for loading, transferring, and storing mineral filler; systems for mixing hot mix asphalt; and the loading, transfer, and storage systems associated with emission control systems.

§ 60.91.....Definitions

This section contains the definitions of this subpart.

§ 60.92.....Standard for particulate matter

In accordance with §60.92, no owner or operator shall discharge or cause the discharge into the atmosphere from any affected facility any gases which contain particulate matter in excess of 0.04 gr/dscf or exhibit 20% opacity or greater. Permit Condition 4.4 includes the requirements of this section.

§ 60.93.....Test methods and procedures

In accordance with §60.93(a), performance tests shall use as reference methods and procedures the test methods in Appendix A of 40 CFR 60.

In accordance with §60.93(b), compliance with the particulate matter standards shall be determined by EPA Reference Method 5, and opacity shall be determined by EPA Reference Method 9. Permit Conditions 4.12 and 4.13 includes the requirements of this section.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT/GACT Applicability (40 CFR 63)

The facility is not subject to any MACT standards in 40 CFR Part 63.

Permit Conditions Review

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Revised Permit Condition 2.4

The collocation restrictions have been revised to include restrictions for any location with an additional concrete batch plant or asphalt plant.

Revised Permit Condition 2.6

The collocation demonstration recordkeeping has been revised to measure from the exhaust stack of the HMA drum dryer.

Revised Permit Condition 3.1

This permit condition has been revised to include a second truck mix concrete batch plant that is identical to the existing concrete batch plant at the facility.

Revised Permit Condition 3.2

Table 3.1 in Permit Condition 3.2 has been revised to include identical emission units that will exist at both concrete batch plants.

Revised Permit Condition 3.3

Table 3.2 in Permit Condition 3.3 has been revised to include the emission limits for concrete batch plant No. 2.

Revised Permit Condition 3.5

This permit condition has been revised to include the concrete production limits for concrete batch plant No. 2.

Revised Permit Condition 3.6

This permit condition has been revised to include the reduced concrete production limits for concrete batch plant No. 2.

Revised Permit Conditions 3.7 through 3.9

These permit conditions have been revised to include the requirements for both concrete batch plants.

New Permit Conditions 4.1 through 4.22

Permit Condition 4.1 provides a process description of the asphalt production process at this facility.

Permit Condition 4.2 provides a description of the control devices used on the asphalt production equipment at this facility.

Permit Condition 4.3 establishes hourly and annual emissions limits for $PM_{2.5}$, SO_2, NO_X, CO, and VOC emissions from the asphalt production operation at this facility.

As discussed previously Permit Condition 4.4 incorporates the particulate matter and opacity standards of 40 CFR 60, Subpart I – Standards of Performance for Hot Mix Asphalt Plants.

As discussed previously, Permit Condition 4.5 establishes a 20% opacity limit for the asphalt drum mixer baghouse stack, the asphaltic oil tank heater stack, the load-out station stack(s), and the silo filling slat conveyor stacks or functionally equivalent openings associated with the asphalt production operation.

Permit Condition 4.6 establishes an hourly, a daily, and an annual asphalt production limit for the asphalt production operation as proposed by the Applicant.

Permit Condition 4.7 establishes a daily asphalt production limit for the asphalt production operation when operated on days when a collocated portable rock crusher is operated. This requirement was based upon the air quality modeling analysis performed for this application.

Permit Condition 4.8 establishes limits for the raw materials used in the asphalt production operation as proposed by the Applicant.

Permit Condition 4.9 establishes that a baghouse be used to control emissions from the asphalt drum mixer as proposed by the Applicant.

Permit Condition 4.10 establishes fuel use restrictions for combustion in the asphalt drum mixer. These fuel use restrictions were based on the fuels proposed by the Applicant to be combusted in the asphalt drum mixer.

Permit Condition 4.11 establishes fuel use restrictions for combustion in the asphaltic oil tank heater. These fuel use restrictions were based on the fuels proposed by the Applicant to be combusted in the asphaltic oil tank heater.

Permit Condition 4.12 establishes PM performance testing requirements as required by 40 CFR 60, Subpart I for Hot Mix Asphalt Plants.

Permit Condition 4.13 establishes PM testing methods and procedures as required by 40 CFR 60, Subpart I for Hot Mix Asphalt Plants.

Permit Condition 4.14 establishes $PM_{2.5}$ performance testing requirements required by DEQ on asphalt plants located in the state of Idaho.

Permit Condition 4.15 establishes $PM_{2.5}$ performance testing methods and procedures required by DEQ on asphalt plants located in the state of Idaho.

Permit Condition 4.16 establishes that the Permittee monitor and record hourly and daily asphalt production to demonstrate compliance with the Asphalt Production Limits permit condition.

Permit Condition 4.17 establishes that the Permittee calculate and record RAP use to demonstrate compliance with the Allowable Raw Materials permit condition.

Permit Condition 4.18 establishes that the Permittee shall establish procedures for operating the baghouse. This is a DEQ imposed standard requirement for operations using baghouses to control particulate emissions.

Permit Condition 4.19 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Permit Condition 4.20 establishes that the permittee shall submit the results of the performance tests to the appropriate DEQ office.

Permit Condition 4.21 establishes that the federal requirements of 40 CFR Part 60, Subpart I – Standards of Performance for Hot Mix Asphalt Plants, are incorporated by reference into the requirements of this permit per current DEQ guidance.

Permit Condition 4.22 incorporates 40 CFR 60, Subpart A – General Provisions.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Data Input

1. Facility Information

Facility Name:	CD'A Redi Mix
Facility ID:	055-00125
Permit and Project No.:	P-2016.0006 Project 62178
Source Type:	Stationary Concrete Batch Plant
Manufacturer/Model:	Con-E-Co / Lo-Pro 12

2. Concrete Production Rates

Maximum Hourly Concrete Production Rate:	220		
Proposed Daily Concrete Production Rate:	750	cy/day	3.41
Proposed Maximum Annual Concrete Production Rate:	75,000	cy/year	hr/day

3. Daily Operating Hours

Maximum daily hours of operation for facility?	12

4. Concrete Batch Plant Specifications

Is the facility type a truck mix (T) or central mix (C)?	T
What level of PM control is used for loadout, either Truck or Central?	99%
What level of PM control is used for fugitive emissions?	75%

5. Water Heater Usage

Does this facility use a water heater?	No		Please select N/A for all u
How many units?	0	Heat Input Rating	
What type of fuel, Diesel, Natural Gas or Propane for unit 1?	N/A	0	MMBtu/hr
If multiple units, what type of fuel, Diesel, Natural Gas or Propane for unit 2?	N/A	0	MMBtu/hr
Are you assuming continual operations throughout the year?	No		
Maximum annual hours of water heater operation? (If assuming continual operation, enter 8,760)	8,760		

6. Internal Combustion Engine(s)

Are internal combustion engines used to provide electrical power at the facility?	No	Please enter 0 for all units.
How many small engines (less than or equal to 600 bhp) are being used at the facility?	0	
Horsepower rating of small engine #1 (<=600 bhp)? (If non-road or no engine enter 0)	0	
Horsepower rating of small engine #2 (<=600 bhp)? (If non-road or no engine enter 0)	0	
Horsepower rating of large engine (greater than 600 bhp)? (If non-road or no engine enter 0)	0	

Note: If there is no small or large engine enter -1 for the certification	Small IC Engine #1	Small IC Engine #2	Large IC Engine
Select the EPA Certification:	-1	-1	-1
Not an EPA-certified IC engine: Enter "0" (zero)			
Certified Tier I, Tier 2, Tier 3, or Tier 4 IC engine: Enter 1, 2, 3, or 4			
Certified "BLUE SKY" IC engine: Enter 5			

Enter the annual operating hours for the small IC engine(s)	0
Enter the annual operating hours for the large IC engine	0

7. Transfer Points

Enter the total number of transfer points in the facility? (2 is the default)	3

CRITERIA POLLUTANT EMISSION INVENTORY for Portable Concrete Batch Plant

3/22/19 7:38

Facility Information

Company:	CDA Redi Mix
Facility ID:	055-00125
Permit and Project No.:	P-2016.0006 Project 62178
Source Type:	Stationary Concrete Batch Plant
Manufacturer/Model:	Con-E-Co / Lo-Pro 12

Assumptions Implied or Stated in Application:

See control assumptions

Truck Mix (T) or Central Mix (C): T

Production Rates[1]

Maximum Hourly Production Rate:	220	cy/hr		Per manufacturer
Proposed Daily Production Rate:	750	cy/day	3.41	Hours of operation per day at max capacity
Proposed Maximum Annual Production Rate:	75,000	cy/year		
Cement Storage Silo Capacity:	4540	ft³ of aerated cement		
Cement Storage Silo Large Compartment Capacity for cement only:	65%	of the silo capacity		
Cement Storage Silo small Compartment Capacity for cement or ash:	35%	of the silo capacity		

PM_{10} Emissions due to this PTC

Emissions Point	PM_{10} Emission Factor[1] (lb/cy)		PM_{10} Emission Factor[2] (lb/cy)		Controlled Emission Rate $PM_{2.5}$, Max.	Controlled Emission Rate PM_{10}, Max.	Controlled Emission Rate $PM_{2.5}$, 24-hour average		Controlled Emission Rate PM_{10}, 24-hour average		Controlled Emission Rate $PM_{2.5}$, annual average		Controlled Emission Rate PM_{10}, annual average		Control Assumptions:
	Controlled	Uncontrolled	Controlled	Uncontrolled	lb/hr[3]	lb/hr[3]	lb/hr[4]	lb/day[4]	lb/hr[4]	lb/day[4]	lb/hr[5]	T/yr[5]	lb/hr[5]	T/yr[5]	
Aggregate delivery to ground storage		0.00096		0.0031	0.05	0.17	0.01	0.18	0.024	0.58	2.05E-03	9.00E-03	0.007	0.029	75% Water Sprays at Operator's Discretion
Sand delivery to ground storage		0.000225		0.0007	0.01	0.04	1.76E-03	0.04	0.005	0.13	4.82E-04	2.11E-03	0.002	0.007	75% Water Sprays at Operator's Discretion
Aggregate transfer to conveyor		0.00096		0.0031	0.05	0.17	0.01	0.18	0.024	0.58	2.05E-03	9.00E-03	0.007	0.029	75% Water Sprays at Operator's Discretion
Sand transfer to conveyor		0.000225		0.0007	0.01	0.04	1.76E-03	0.04	0.005	0.13	4.82E-04	2.11E-03	0.002	0.007	75% Water Sprays at Operator's Discretion
Aggregate transfer to elevated storage		0.00096		0.0031	0.05	0.17	0.01	0.18	0.024	0.58	2.05E-03	9.00E-03	0.007	0.029	75% Water Sprays at Operator's Discretion
Sand transfer to elevated storage		0.000225		0.0007	0.01	0.04	1.76E-03	0.04	0.005	0.13	4.82E-04	2.11E-03	0.002	0.007	75% Water Sprays at Operator's Discretion
Cement delivery to Silo (controlled EF)	0.00003		0.0001		6.60E-03	1.84E-02	**9.38E-04**	2.25E-02	**2.61E-03**	6.26E-02	2.57E-04	1.13E-03	7.15E-04	**3.13E-03**	0.00% Baghouse is process equipment, use controlled EF
Cement supplement delivery to Silo (controlled EF)	0.000045		0.0002		9.90E-03	3.93E-02	**1.41E-03**	3.38E-02	**5.59E-03**	1.34E-01	3.85E-04	1.69E-03	1.53E-03	**6.71E-03**	0.00% Baghouse is process equipment, use controlled EF
Weigh hopper loading (sand & aggregate batcher loading)		**0.001185**		**0.00395**	2.61E-03	8.69E-03	**3.70E-04**	8.89E-03	**1.24E-03**	2.96E-02	1.01E-04	4.44E-04	3.38E-04	**1.48E-03**	99.0% Sealed boot (vents back to silo) or baghouse
Truck Mix loading, Table 11.12-2, "0.3170 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)/ 2000 lb = 0.0874 lb/cy. PM2.5 was calculated as 15% of PM: "1.118 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)*0.15/ 2000 lb = 0.0473 lb/cy		**0.0473**		**0.07874**	1.04E-01	0.17	**0.01**	0.35	**0.02**	0.59	4.05E-03	1.77E-02	0.01	**0.03**	99.0% Boot, enclosure or equivalent or baghouse or boot w/water mig
Central mix loading, Table 11.12-2, "0.156 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)/ 2000 lb = 0.0440 lb/cy. PM2.5 was calculated as 15% of PM: "0.572 lb/ton of cement+flyash" x ((491 lb cement + 73 lb flyash)/cy concrete)*0.15/ 2000 lb = 0.0242 lb/cy		**0.0000**		**0.0000**	0.00E+00	0.00	**0.00**	0.00	**0.00**	0.00	0.00E+00	0.00E+00	0.00	**0.00**	99.0% Baghouse control
Point Sources Total Emissions		**4.86E-02**		**8.30E-02**	**1.23E-01**	**2.40E-01**	**1.75E-02**	**4.20E-01**	**3.40E-02**	**8.17E-01**	**7.44E-04**	**3.26E-03**	**2.58E-03**	**1.13E-02**	
Process Fugitive Emissions		0.003555		0.0114	0.20	0.63	0.03	0.67	0.09	2.14	0.01	0.03	0.02	0.11	
Facility Wide Total: Point Sources + Process Fugitives (Except for Road Dust and Windblown Dust)				0.0944		0.87	0.05	1.09	0.12	2.96			0.03	0.12	

POINT SOURCE EMISSIONS for FACILITY CLASSIFICATION[6] Controlled EF at 1,927,200 cy/yr T/yr (controlled PTE @ 8,760)

Facility Classification Total PM[6]		**8.40E-03**		**8.09E+00**	
Facility Classification Total PM10[6,8]		**4.21E-03**		**4.05E+00**	

1 The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-5, and a percentage of PM that is considered to be $PM_{2.5}$. The percentage used to establish the EFs were based on AP-42, Appendix B, Table B-2.2, Category 3. It was established that the fraction that is $PM_{2.5}$ is 15%. Note that the aggregate and sand handling are static EF's in this spreadsheet, but varies during modeling as the wind speed changes each hour.

2 The EFs were calculated using EFs in lb/ton of material handled from Table 11.12-2, typical composition per cubic yard of concrete (1865 lb aggregate, 1428 lbs sand, 491 lbs cement, 73 lbs cement supplement, and 20 gallons of water = 4024 lb/cy), and closely match Table 11.12-5 values (version 6/06) when rounded to the same number of figures. AP-42 lists the same EFs for uncontrolled and controlled emissions, so control estimates are based on the assumed control levels input on the right hand side of the table.

3 Max. hourly rate includes reductions associated with control assumptions.

4 Hourly emissions rate (24-hr average) = Max.hourly emissions rate x (hrs per day) / 24.
Daily emissions rate = max emissions rate (1-hr average) x proposed hrs/day.

5 Annual average hourly emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) / (8760 hr/yr).
Annual emissions rate = EF (lb/cy) x proposed annual production rate (cy/yr) /(2000 lb/T)

6 Controlled EFs for PM = 0.0002 (cement silo) + 0.0003 (flyash silo) +0.0079(weigh batcher)
for PM10 = 0.0001 (cement silo) + 0.0002 (flyash silo) +0.0040 (weigh batcher)

7 Emissions for Facility Classification are based on baghouses as process equipment, 24-hr day, 8760 hr/yr = 5,260 cy/day, and 1,927,200 cy/yr

8 Emissions for Facility Classification do not include truck mix loading emissions; this is typically considered a fugitive emission source for concrete batch plants.

Lead emissions

Emissions Point	Lead Emission Factor[1] (lb/ton of material loaded)		Increase in Emissions from this PTC: Emission Rate, Max.	Emissions for Comparison with DEQ Modeling Threshold		Emission Rate, Quarterly	Emissions for Facility Classification	
	Controlled with fabric	Uncontrolled	lb/hr, 1-hr avg[2]	lb/month[3]	T/yr[4]	lb/hr qtrly avg[5]		T/yr
Cement delivery to silo [2]	**1.09E-08**	7.36E-07	5.89E-07	6.10E-05	2.01E-04	8.36E-08	Point Source	2.58E-06
Cement supplement delivery to Silo [3]	**5.20E-07**	ND	4.18E-06	4.33E-04	1.42E-03	5.93E-07	Point Source	1.83E-05
Truck Loadout (with 99.9% control) [6]		**3.62E-06**	2.25E-06	2.33E-04	7.66E-04	3.19E-07	Fugitive	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total			**7.01E-06**	**7.27E-04**	**0.002**		**Point Sources**	**2.09E-05**
DEQ Modeling Threshold				100	0.6			
Modeling Required?				No	No			

1 The emissions factors are from AP-42, Table 11.12-5 (version 06/06)
2 Max. hourly rate = EF x pound of cement/yd³ of concrete x max. hourly concrete production rate/(2000 lb/T)
3 lb/mo = EF x pound of material/yd³ of concrete x max. daily concrete production rate x (365/12)/(2000 lb/T)
4 T/yr = EF x pound of material/yd³ of concrete x max. annual concrete production rate/(2000 lb/T)
5 lb/hr, qtrly avg = lb/mo x 3 months per qtr / (8760/4)hrs per qtr

Toxic Air Pollutant (TAPs) EMISSIONS INVENTORY, Concrete Batch Plant

3/22/2019 7:38

Facility Information

Company:	CD'A Redi Mix
Facility ID:	055-00125
Permit No.:	P-2016.0006 Project 62178
Source Type:	Stationary Concrete Batch Plant
Manufacturer:	Con-E-Co / Lo-Pro 12

Emissions estimates are based on EFs in AP-42, Table 11.12-8 (version 06/06) and the following composition of one yard of concrete:

Coarse aggregate		1865 pounds
Sand		1428 pounds
Cement		491 pounds
Cement supplement		73 pounds
Water		20 gallons
Concrete		**4024 pounds**

Truck Mix Loadout Factor: 1

Central Mix Batching Factor: 0

DEQ EI VERIFICATION WORKSHEET Version 032007
Tip: Blue text or numbers are meant to be changed.
Black text or numbers indicates it's hard-wired or calculated.
Review these before you change them.

Concrete Production

Maximum Hourly Production Rate:	220	cy/hr	
Proposed Daily Production Rate:	750	cy/day	
Proposed Maximum Annual Production Rate:	75,000	cy/year	

Uncontrolled (Unlimited Production Rate)

5,280 cy/day	24 hrs/day, 7 day/wk,
1,927,200 cy/year	52 wks/year

TAP Emission Factors from AP-42, Table 11.12-8 (Version 06/06)

Emissions Point	Arsenic EF (lb/ton of material loaded)		Beryllium EF (lb/ton of material loaded)		Cadmium EF (lb/ton of material loaded)		Chromium EF (lb/ton of material loaded)		Manganese EF (lb/ton of material loaded)		Nickel EF (lb/ton of material loaded)		Phosphorus EF (lb/ton of material loaded)		Selenium EF (lb/ton of material loaded)		Chromium VI
	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Controlled with Fabric filter	Uncontrolled	Percent of total Cr that is Cr+6
Cement silo filling (with baghouse)	**4.24E-09**	1.68E-06	**4.86E-10**	1.79E-08	ND	2.34E-07	**2.90E-08**	2.52E-07	**1.17E-07**	2.02E-04	**4.18E-08**	1.76E-05	ND	**1.18E-05**	ND	ND	**20%**
Cement supplement silo filling (with baghouse)	**1.00E-06**	ND	**9.04E-08**	ND	**1.98E-10**	ND	**1.22E-06**	ND	**2.56E-07**	ND	**2.28E-06**	ND	**3.54E-06**	ND	**7.24E-08**	ND	**30%**
Truck loading (no boot or shroud)	6.02E-07	**1.22E-05**	1.04E-07	**2.44E-07**	9.06E-09	**3.42E-08**	4.10E-06	**1.14E-05**	2.08E-05	**6.12E-05**	4.78E-06	**1.19E-05**	1.23E-05	**3.84E-05**	1.13E-07	**2.62E-06**	**21.29%**
Central Mix Batching (NO boot or shroud)	0.00E+00	**0.00E+00**	ND	ND	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	0.00E+00	**0.00E+00**	ND	ND	**21.29%**

UNCONTROLLED TAP EMISSIONS **Note: Includes baghouses as process equipment.** **5,280 cy/day, and** **1,927,200 cy/yr**

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement silo filling (with baghouse)	2.29E-07	1.00E-06	2.62E-08	1.15E-07	1.26E-05	5.54E-05	1.57E-06	5.96E-05	6.32E-06	2.77E-05	2.26E-06	9.89E-06	6.37E-04	2.79E-03	ND	ND	3.13E-07		
Cement supplement silo filling (with baghouse)	8.03E-06	3.52E-05	7.26E-07	3.18E-06	1.59E-09	6.96E-09	9.80E-06	4.29E-05	2.06E-06	9.00E-06	1.83E-05	8.02E-05	2.84E-05	1.25E-04	5.81E-07	2.55E-06	2.94E-06		
Truck loading (no boot or shroud)	7.57E-04	3.32E-03	1.51E-05	6.63E-05	2.12E-06	9.29E-06	7.07E-04	3.10E-03	3.80E-03	1.66E-02	7.38E-04	3.23E-03	2.38E-03	1.04E-02	1.63E-04	7.12E-04	1.51E-04		
[illegible]	[illegible]	[illegible]	ND	ND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND	[illegible]		
Sources Total	**7.65E-04**	3.35E-03	**1.59E-05**	6.96E-05	**1.48E-05**	6.47E-05	**7.19E-04**	3.20E-03	**3.81E-03**	1.67E-02	**7.59E-04**	3.32E-03	**3.05E-03**	1.34E-02	**1.63E-04**	7.14E-04	**1.54E-04**	**4.07E-02**	**Tons per year**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
EXCEEDS EL?	**Yes**		No		**Yes**		No		No		**Yes**		No		No		**Yes**		

CONTROLLED TAP EMISSIONS **Note: Includes baghouses as process equipment.** **750 cy/day, and** **75,000 cy/year**

Emissions Point	Arsenic		Beryllium		Cadmium		Chromium		Manganese		Nickel		Phosphorus		Selenium		Chromium VI		
	lb/hr annual avg.	T/yr[4]	lb/hr annual avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr[5]	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr 24-hr avg.	T/yr	lb/hr annual avg.		
Cement silo filling (with baghouse)[1]	8.91E-09	3.90E-08	1.02E-09	4.47E-09	4.92E-07	2.15E-06	2.22E-07	2.67E-07	8.98E-07	1.08E-06	8.79E-08	3.85E-07	ND	ND	ND	ND	1.22E-08		
Cement supplement silo filling (with baghouse)[2]	3.13E-07	1.37E-06	2.83E-08	1.24E-07	6.19E-11	2.71E-10	9.36E-06	1.67E-06	1.96E-06	3.50E-07	7.13E-07	3.12E-06	2.72E-05	4.85E-06	8.26E-08	9.91E-08	1.14E-07		
Truck loading (with baghouse)	2.95E-07	1.29E-06	5.89E-09	2.58E-08	8.26E-10	3.62E-09	1.00E-06	1.21E-06	5.39E-06	6.47E-06	2.87E-07	1.26E-06	3.38E-06	4.06E-06	2.31E-07	2.77E-07	5.86E-08	**99.00%**	Boot, enclosure, or equivalent or baghouse or boot w/water rina
[illegible]	[illegible]	[illegible]	ND	ND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND	[illegible]	[illegible]	[illegible]
Sources Total	**6.16E-07**	2.70E-06	**3.52E-08**	1.54E-07	**4.93E-07**	2.16E-06	**1.06E-05**	3.14E-06	**8.25E-06**	7.90E-06	**1.09E-06**	4.76E-06	**3.05E-05**	8.91E-06	**3.13E-07**	3.76E-07	**1.85E-07**	**3.01E-05**	**Tons per year**
IDAPA Screening EL (lb/hr)	1.50E-06		2.80E-05		3.70E-06		3.30E-02		3.33E-01		2.70E-05		7.00E-03		1.30E-02		5.60E-07		
Percent of EL	41.06%		0.13%		13.32%		0.03%		0.0025%		4.03%		0.44%		0.0024%		33.07%		
EXCEEDS EL?	**No**		No		**No**		No		No		**No**		No		No		**No**		

[1] lb/hr, annual average = EF x pound of cement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr = EF x pound of cement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton / 24 hr/day

[2] lb/hr, annual average = EF x pound of cement supplement / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of cement supplement / Yd3 of concrete x daily concrete production rate / 2000lb/Ton

[3] lb/hr, annual average = EF x pound of (cement + cement supplement) / Yd^3 of concrete x annual concrete production rate / 2000lb/Ton / 8760 hr/yr; lb/hr, 24-hr average = EF x pound of (cement + cement supplement) / Yd3 of concrete x daily concrete production

[4] T/yr = lb/hr, annual avg x 8760 hr/yr x (1T/2000 lb)

[5] T/yr = EF x pound of cement, or cement supplement, or cement + cement supplement x annual concrete production rate /2000 lb/ton / 2000 lb/ton

NATURAL GAS COMBUSTION, AP-42 SECTION 1.4 (7/98)

Operating Assumptions: 0 MMBtu/hr / 1,020 MMBtu/MMscf = 0.00E+00 MMscf/hr

0 hr/day

0 hr/yr

Fuel Use:

0.000 MMscf/day

0.000 MMscf/year

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required?	Modeling Threshold		Modeling Required?
	lb/MMscf	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	100	0.00E+00	0.00E+00	0.00E+00	1	T/yr	No	7	T/yr	No
CO	84	0.00E+00	0.00E+00	0.00E+00	14	lb/hr	No	70	lb/hr	No
PM10	7.6	0.00E+00	0.00E+00	1.13E-02	0.2	lb/hr	No	0.9	lb/hr	No
		0.00E+00	0.00E+00		1	T/yr	No	7	T/yr	No
PM2.5	7.6	0.00E+00	0.00E+00	3.26E-03						
		0.00E+00	0.00E+00							
SOx	0.6	0.00E+00	0.00E+00	0.00E+00	0.2	lb/hr	No	0.9	lb/hr	No
		0.00E+00	0.00E+00		1	T/yr	No	7	T/yr	No
VOC	5.5	0.00E+00	0.00E+00	0.00E+00	40	T/yr	No			
Lead	0.0005	0.00E+00	0.00E+00	2.39E-03	0.6	T/yr	No			
Lead, continued			5.37E-03	lb/quarter	10	lb/mo	No			
		TOTAL	0.00E+00	T/yr	Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)					

Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)					Exceeds EL/ Modeling Required?
	lb/MMscf	lb/hr	T/yr	EL (lb/hr)	
PAH HAPs					
2-Methylnaphthalene	2.40E-05	0.00E+00	0.00E+00	9.10E-05	No
3-Methylchloranthrene	1.80E-06	0.00E+00	0.00E+00	2.50E-06	No
7,12-Dimethylbenz(a)anthrac	1.60E-05	0.00E+00	0.00E+00		
Acenaphthene	1.80E-06	0.00E+00	0.00E+00	9.10E-05	No
Acenaphthylene	1.80E-06	0.00E+00	0.00E+00	9.10E-05	No
Anthracene	2.40E-06	0.00E+00	0.00E+00	9.10E-05	No
Benzo(a)anthracene	1.80E-06	0.00E+00	0.00E+00	9.10E-05	See POM
Benzo(a)pyrene	1.20E-06	0.00E+00	0.00E+00	2.00E-06	See POM
Benzo(b)fluoranthene	1.80E-06	0.00E+00	0.00E+00		See POM
Benzo(g,h,i)perylene	1.20E-06	0.00E+00	0.00E+00	9.10E-05	No
Benzo(k)fluoranthene	1.80E-06	0.00E+00	0.00E+00		See POM
Chrysene	1.80E-06	0.00E+00	0.00E+00		See POM
Dibenzo(a,h)anthracene	1.20E-06	0.00E+00	0.00E+00		See POM
Dichlorobenzene	1.20E-03	0.00E+00	0.00E+00	9.10E-05	No
Fluoranthene	3.00E-06	0.00E+00	0.00E+00	9.10E-05	No
Fluorene	2.80E-06	0.00E+00	0.00E+00	9.10E-05	No
Indeno(1,2,3-cd)pyrene	1.80E-06	0.00E+00	0.00E+00		See POM
Naphthalene	6.10E-04	0.00E+00	0.00E+00	3.33	No
Naphthalene	6.10E-04	0.00E+00	0.00E+00	9.10E-05	No
Phenanathrene	1.70E-05	0.00E+00	0.00E+00	9.10E-05	No
Pyrene	5.00E-06	0.00E+00	0.00E+00	9.10E-05	No
Polycyclic Organic Matter (POM) 7-PAH Grou		0.00E+00	0.00E+00	2.00E-06	No
Non-PAH HAPs					
Benzene	2.10E-03	0.00E+00	0.00E+00	8.00E-04	No
Formaldehyde	7.50E-02	0.00E+00	0.00E+00	5.10E-04	No
Hexane	1.80E+00	0.00E+00	0.00E+00	12	No
Toluene	3.40E-03	0.00E+00	0.00E+00	25	No
Non-HAP Organic Compounds					
Butane	2.10E+00	0.00E+00	0.00E+00		
Ethane	3.10E+00	0.00E+00	0.00E+00		
Pentane	2.60E+00	0.00E+00	0.00E+00	118	No
Propane	1.60E+00	0.00E+00	0.00E+00		
Metals (HAPs)					
Arsenic	2.00E-04	0.00E+00	0.00E+00	1.50E-06	No
Barium	4.40E-03	0.00E+00	0.00E+00	0.033	No
Beryllium	1.20E-05	0.00E+00	0.00E+00	2.80E-05	No
Cadmium	1.10E-03	0.00E+00	0.00E+00	3.70E-06	No
Chromium	1.40E-03	0.00E+00	0.00E+00	0.033	No
Cobalt	8.40E-05	0.00E+00	0.00E+00	0.0033	No
Copper	8.50E-04	0.00E+00	0.00E+00	0.013	No
Manganese	3.80E-04	0.00E+00	0.00E+00	0.067	No
Mercury	2.60E-04	0.00E+00	0.00E+00	0.003	No
Molybdenum	1.10E-03	0.00E+00	0.00E+00	0.333	No
Nickel	2.10E-03	0.00E+00	0.00E+00	2.70E-05	No
Selenium	2.40E-05	0.00E+00	0.00E+00	0.013	No
Vanadium	2.30E-03	0.00E+00	0.00E+00	0.003	No
Zinc	2.90E-02	0.00E+00	0.00E+00	0.667	No

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

Case-by-Case Modeling Thresholds may be used ONLY with DEQ Approval

TOTAL CBP + WATER HEATER EMISSIONS (POINT SOURCES, T/YR)	0.02

DIESEL COMBUSTION, AP-42 SECTION 1.3 (9/98)

Operating Assumptions: **0** MMBtu/hr / 140 MMBtu/10^3 gal = 0.00E+00 10^3 gal/hr **Fuel Use:** **0.00 gal/day**
0 hr/day **0** gal/year
0 hr/yr
0.0015% sulfur

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required?	Modeling Threshold		Modeling Required?
	lb/10^3 gal	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	20	0.00E+00	0.00E+00	0.00E+00	1	T/yr	No	7	T/yr	No
CO	5	0.00E+00	0.00E+00	0.00E+00	14	lb/hr	No	70	lb/hr	No
PM10 (filterable + condensable)	3.3	0.00E+00	0.00E+00	1.13E-02	0.2	lb/hr	No	0.9	lb/hr	No
		0.00E+00	0.00E+00		1	T/yr	No	7	T/yr	No
PM2.5 (filterable + condensable)	1.8	0.00E+00	0.00E+00	3.26E-03						
		0.00E+00	0.00E+00							
SOx (SO2 + SO3)	0.216	0.00E+00	0.00E+00	0.00E+00	0.2	lb/hr	No	0.9	lb/hr	No
		0.00E+00	0.00E+00		1	T/yr	No	7	T/yr	No
VOC (TOC)	0.556	0.00E+00	0.00E+00	0.00E+00	40	T/yr	No			
Lead EF = 9 lb/10^{12} Btu	9	0.00E+00	0.00E+00	2.39E-03	0.6	T/yr	No			
Lead, continued			0.00E+00	lb/quarter	10	lb/mo	No			
		TOTAL	0.00E+00	T/yr	Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)					

Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)					Exceeds EL/ Modeling Required?
	lb/10^3 gal	lb/hr	T/yr	EL (lb/hr)	
PAH HAPs					
Acenaphthene	2.11E-05	0.00E+00	0.00E+00	9.10E-05	No
Acenaphthylene	2.57E-07	0.00E+00	0.00E+00	9.10E-05	No
Anthracene	1.22E-06	0.00E+00	0.00E+00	9.10E-05	No
Benzo(a)anthracene	4.01E-06	0.00E+00	0.00E+00	9.10E-05	See POM
Benzo(a)pyrene				2.00E-06	See POM
Benzo(b,k)fluoranthene	1.48E-06	0.00E+00	0.00E+00		See POM
Benzo(g,h,i)perylene	2.26E-06	0.00E+00	0.00E+00	9.10E-05	No
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00		See POM
Chrysene	2.38E-06	0.00E+00	0.00E+00		See POM
Dibenzo(a,h)anthracene	1.67E-06	0.00E+00	0.00E+00		See POM
Dichlorobenzene				9.10E-05	No
Fluoranthene	4.84E-06	0.00E+00	0.00E+00	9.10E-05	No
Fluorene	4.47E-06	0.00E+00	0.00E+00	9.10E-05	No
Indeno(1,2,3-cd)pyrene	2.14E-06	0.00E+00	0.00E+00		See POM
Naphthalene	1.13E-03	0.00E+00	0.00E+00	3.33	No
Naphthalene	1.13E-03	0.00E+00	0.00E+00	9.10E-05	No
Phenanathrene	1.05E-05	0.00E+00	0.00E+00	9.10E-05	No
Pyrene	4.25E-06	0.00E+00	0.00E+00	9.10E-05	No
Polycyclic Organic Matter (POM)	7-PAH Group	0.00E+00	0.00E+00	2.00E-06	No
Non-PAH HAPs					
Benzene	2.14E-04	0.00E+00	0.00E+00	8.00E-04	No
Ethyl benzene	6.36E-05	0.00E+00	0.00E+00	2.90E+01	No
Formaldehyde	3.30E-02	0.00E+00	0.00E+00	5.10E-04	No
Hexane	1.80E+00	0.00E+00	0.00E+00	12	No
Toluene	6.20E-03	0.00E+00	0.00E+00	25	No
o-Xylene	1.09E-04			0.007	
Metals (HAPs)	lb/10^{12} Btu				
Arsenic	4.00E+00	0.00E+00	0.00E+00	1.50E-06	No
Barium				0.033	No
Beryllium	3.00E+00	0.00E+00	0.00E+00	2.80E-05	No
Cadmium	3.00E+00	0.00E+00	0.00E+00	3.70E-06	No
Chromium	3.00E+00	0.00E+00	0.00E+00	0.033	No
Cobalt				0.0033	No
Copper	6.00E+00	0.00E+00	0.00E+00	0.013	No
Manganese	6.00E+00	0.00E+00	0.00E+00	0.067	No
Mercury	3.00E+00	0.00E+00	0.00E+00	0.003	No
Molybdenum				0.333	No
Nickel	3.00E+00	0.00E+00	0.00E+00	2.70E-05	No
Selenium	1.50E+01	0.00E+00	0.00E+00	0.013	No
Vanadium				0.003	No
Zinc	4.00E+00	0.00E+00	0.00E+00	0.667	No

NOTE: TAPs lb/hr emissions are 24-hour averages unless shown in bold. Bold emissions are annual averages for carcinogens.

Case-by-Case Modeling Thresholds may be used ONLY with DEQ Approval

TOTAL CBP + WATER HEATER EMISSIONS (POINT SOURCES, T/YR)	0.02

1,1,1-Trichloroethane 2.36E-04 Not a HAP (1,1,2 TCA is a HAP). Not a 585 or 586 TAP.

PROPANE/BUTANE COMBUSTION, AP-42 SECTION 1.5 (9/98)

Operating Assumptions: 0 MMBtu/hr / 91.5 MMBtu/10^3 gal = 0.00E+00 10^3 gal/hr **Fuel Use:**
0 hr/day **0.00 gal/day**
0 hr/yr **0 gal/year**

Criteria Air Pollutants	Emission Factor	Emissions		CBP + Boiler Emissions	Modeling Threshold		Modeling Required?	Modeling Threshold		Modeling Required?
	lb/10^3 gal	lb/hr	T/yr	T/yr	2002 Guidance			Case-by-Case		
NO2	15	0.00E+00	0.00E+00	0.00E+00	1	T/yr	No	7	T/yr	No
CO	5.4	0.00E+00	0.00E+00	0.00E+00	14	lb/hr	No	70	lb/hr	No
PM10 (filterable + condensable)	0.8	0.00E+00	0.00E+00	1.13E-02	0.2	lb/hr	No	0.9	lb/hr	No
		0.00E+00	0.00E+00		1	T/yr	No	7	T/yr	No
PM2.5 (filterable + condensable)	0.8	0.00E+00	0.00E+00	3.26E-03						
		0.00E+00	0.00E+00							
SOx (SO2 + SO3)	1.479	0.00E+00	0.00E+00	0.00E+00	0.2	lb/hr	No	0.9	lb/hr	No
		0.00E+00	0.00E+00		1	T/yr	No	7	T/yr	No
VOC (TOC)	1.1	0.00E+00	0.00E+00	0.00E+00	40	T/yr	No			
Lead EF = 9 lb/10^{12} Btu	0	0.00E+00	0.00E+00	2.39E-03	0.6	T/yr	No			
Lead, continued			0.00E+00	lb/quarter	10	lb/mo	No			
		TOTAL	0.00E+00	T/yr	Note: 100 lb/mo Pb in guidance reduced by factor of 10 based on latest Pb NAAQS (reduced in 2008 from 1.5 ug/m3 to 0.15 ug/m3)					

Case-by-Case Modeling Thresholds may be used ONLY with DEQ Approval

TOTAL CBP + WATER HEATER EMISSIONS (POINT SOURCES, T/YR)	0.02

CURRENT PTC APPLICATION ESTIMATES

Do you have an internal combustion engine? **No**

Internal Combustion Engine(s) AP-42 Section 3.3 or 3.4 (diesel fueled)			
		Fuel Type(s)	Generator Toggle
Generator Make/Model	Enter Info	#2 Fuel Oil (Diesel)	1
Rating of Large Engine (hp)	0.0	Max Sulfur weight percent (w/o)	0.0015%
Rating of Small Engine #1 (hp)	0.0		
Rating of Small Engine #2 (hp)	0.0		
EF OPTIONS:		Use EFs in lb/MMBtu fuel input	
1 hp = 0.7456999 kW	0.7457	Calculated Max Fuel Use Rate, gal/hr (Large)	0.00
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Calculated Max Fuel Use Rate, gal/hr (small #1)	0.00
Fuel Heating Value, Btu/gal	137,030	Calculated Max Fuel Use Rate, gal/hr (small #2)	0.00
		Calculated MMBtu/hr (Large)	0.00
		Calculated MMBtu/hr (Small #1)	0.00
		Calculated MMBtu/hr (Small #2)	0.00
Note: AP-42 Tables 3.3-x,3.4-x: avg diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal=> Btu/gal =			137,030

EPA Certification for Large Engine:	-1
Not EPA-certified: Enter "0" (zero)	
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4	
Certified "BLUE SKY" engine: Enter 5	

EPA Certification for Small Engine #1:	-1
Not EPA-certified: Enter "0" (zero)	
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4	
Certified "BLUE SKY" engine: Enter 5	

EPA Certification for Small Engine #2:	-1
Not EPA-certified: Enter "0" (zero)	
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4	
Certified "BLUE SKY" engine: Enter 5	

Facility: CD'A Redi Mix

3/22/2019 7:38 Permit/Facility ID: P-2016.0006 Project 62178 055-00125

Greenhouse Gas Emissions when Combusting Natural Gas

Water Heater #1 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	0	lb/MMscf	AP-42 Table 1.4-2	0.00	1	0.00
Methane	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	21	0.00E+00
N_2O	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	310	0.00E+00

* Water Heater #1 does not burn Natural Gas.

Water Heater #2 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	0	lb/MMscf	AP-42 Table 1.4-2	0.00	1	0.00
Methane	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	21	0.00E+00
N_2O	0	lb/MMscf	AP-42 Table 1.4-2	0.00E+00	310	0.00E+00

* Water Heater #2 does not burn Natural Gas.

Greenhouse Gas Emissions when Combusting #2 Diesel

Water Heater #1 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	Molecular conversion from C to CO_2			0.00	1	0.00
Methane	0	$lb/10^3$ gal	AP-42 Table 1.3-3	0.00E+00	21	0.00E+00
N_2O	0	$lb/10^3$ gal	AP-42 Table 1.3-8	0.00E+00	310	0.00E+00

* Water Heater #1 does not burn Diesel.

Water Heater #2 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	Mocular conversion from C to CO_2			0.00	1	0.00
Methane	0	$lb/10^3$ gal	AP-42 Table 1.3-3	0.00E+00	21	0.00E+00
N_2O	0	$lb/10^3$ gal	AP-42 Table 1.3-8	0.00E+00	310	0.00E+00

* Water Heater #2 does not burn Diesel.

Greenhouse Gas Emissions when Combusting LPG

Water Heater #1 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	0	$lb/10^3$ gal	AP-42 Table 1.5-1	0.00	1	0.00
Methane	0	$lb/10^3$ gal	AP-42 Table 1.5-1	0.00E+00	21	0.00E+00
N_2O	0	$lb/10^3$ gal	AP-42 Table 1.5-1	0.00E+00	310	0.00E+00

* Water Heater #1 does not burn Propane.

Water Heater #2 Emissions	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	0	$lb/10^3$ gal	AP-42 Table 1.5-1	0.00	1	0.00
Methane	0	$lb/10^3$ gal	AP-42 Table 1.5-1	0.00E+00	21	0.00E+00
N_2O	0	$lb/10^3$ gal	AP-42 Table 1.5-1	0.00E+00	310	0.00E+00

* Water Heater #2 does not burn Propane.

Greenhouse Gas Emissions when Combusting Diesel Fuel

Small Engine #1 Emissions ≤ 600 bhp	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	1.15	lb/bhp-hr	AP-42 Table 3.3-1	0.00	1	0.00

* There are no engines at this facility.

Small Engine #2 Emissions ≤ 600 bhp	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	1.15	lb/bhp-hr	AP-42 Table 3.3-1	0.00	1	0.00

* There is no second small engine at this facility.

Large Engine #1 Emissions > 600 bhp	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1	0.00

* There is no large engine at this facility.

Total Greenhouse Gas Emissions

	CO_2e (T/yr)
CO_2	0.00
Methane	0.00
N_2O	0.00
Total	**0.00**

Facility: **CD'A Redi Mix**
3/22/2019 7:38 **Permit/Facility ID:** **055-00125** **P-2016.0006 Project 62178**

Max Hourly Production	220 cy/hr	**82%** T/hr is Aggregate =	**180 cy/hr**
Max Daily Production	750 cy/day	82% T/hr is Aggregate =	**615 cy/day**
Max Annual Production	75,000 cy/yr	82% T/hr is Aggregate =	**61,500 cy/yr**

Aggregate is considered both coarse and fine (sand).The 82% is based on 1,865 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for a total of 4,024 lb concrete

Truck Mix Operations Drop Points, AP-42 11-12 (06/06)

$E = k\ (0.0032) \times (U^a / M^b) + c$ = 9.71E-02 3.88E-02 lb/ton for PM10 5.83E-03 lb/ton for PM2.5

k = particle size multiplier	0.8 for PM	0.32 for PM10	0.048 for PM2.5
a = exponent	1.75 for PM	1.75 for PM10	1.75 for PM2.5
b = exponent	0.3 for PM	0.3 for PM10	0.3 for PM2.5
c = constant	0.013 for PM	0.0052 for PM10	0.00078 for PM2.5
U = mean wind speed =	**10** mph		
M = moisture content =	**6** %		

Mean wind spped: 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO).

Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises Cement plant in Roanoke, VA, 1994. (AP-42 11-12 06/06).

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	F = Eavg mph/
Cat 1:	1.54	0.77	1.72	6.75E-03	0.1738	1.01E-03	0.1738
Cat 2:	3.09	2.32	5.18	1.58E-02	0.4077	2.38E-03	0.4077
Cat 3:	5.14	4.12	9.20	3.43E-02	0.8831	5.15E-03	0.8831
Cat 4:	8.23	6.69	14.95	7.32E-02	1.885	1.10E-02	1.885
Cat 5:	10.80	9.52	21.28	1.31E-01	3.382	1.97E-02	3.382
Cat 6:	14.00	12.40	27.74	2.06E-01	5.298	3.09E-02	5.298

Central Mix Operations Drop Points, AP-42 11-12 (06/06)

$E = k\ (0.0032) \times (U^a / M^b) + c$ = 2.08E-03 1.23E-03 lb/ton for PM10 2.54E-04 lb/ton for PM2.5

k = particle size multiplier	0.19 for PM	0.13 for PM10	0.03 for PM2.5
a = exponent	0.95 for PM	0.45 for PM10	0.45 for PM2.5
b = exponent	0.9 for PM	0.9 for PM10	0.9 for PM2.5
c = constant	0.001 for PM	0.001 for PM10	0.0002 for PM2.5
U = mean wind speed =	**10** mph		
M = moisture content =	**6** %		

Mean wind spped: 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO).

Moisture Content: 4.17 % and 1.77% were the average percentages for sand and aggegate respectively. These values are based on EPA tests conducted at Cheney Enterprises

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	F = Eavg mph/
Cat 1:	1.54	0.77	1.72	1.11E-03	0.8964	2.24E-04	0.8838
Cat 2:	3.09	2.32	5.18	1.87E-03	1.5160	2.40E-04	0.9456
Cat 3:	5.14	4.12	9.20	2.13E-03	1.7261	2.52E-04	0.9922
Cat 4:	8.23	6.69	14.95	2.41E-03	1.949	2.65E-04	1.0422
Cat 5:	10.80	9.52	21.28	2.65E-03	2.146	2.76E-04	1.0860
Cat 6:	14.00	12.40	27.74	2.86E-03	2.315	2.85E-04	1.1238

Conveyor and Scalping Screen Emission Points

Moisture/Control %:

Aggregate for CBP typically stabilizes between 5-6% by weight--> Apply additional **25%** control to lb/hr, etc. for the higher moisture.

Sand aggregate for CBPs is **35%**

Coarse aggregate for CBPs is **46%**

Fine Aggegate (Sand) Transfer to Conveyor

Transfer from truck to conveyor: **180** cy/hr **3** Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0015	0.088	0.012	1.50E-02	3.42E-03	0.264	0.037	4.49E-02	1.03E-02
PM-10 (total)	7.00E-04	0.041	0.006	6.99E-03	1.60E-03	0.123	0.017	2.10E-02	4.79E-03
PM-2.5 (total)	2.25E-04	0.013	0.002	2.25E-03	9.84E-03	0.040	0.006	6.74E-03	2.95E-02

0.166

1.256

Coarse Aggegate Transfer to Conveyor

Transfer from truck to conveyor: **180** cy/hr **3** Transfer Points

Pollutant	Emission Factor Table 11.12-5 CONVEYOR TRANSFER PT CONTROLLED (lb/cy)	Emissions Per Transfer Point: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Total Emissions: Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.0064	0.486	0.069	8.28E-02	1.89E-02	1.457	0.207	2.48E-01	5.67E-02
PM-10 (total)	3.10E-03	0.235	0.033	4.01E-02	9.16E-03	0.706	0.100	1.20E-01	2.75E-02
PM-2.5 (total)	9.60E-04	0.073	0.010	1.24E-02	5.44E-02	0.219	0.031	3.73E-02	1.63E-01

Transfer Points

Final Concrete Batch Plant Emissions Inventory

Listed Below are the emissions estimates for the units selected.

Company:	**CD'A Redi Mix**
Facility ID:	**055-00125**
Permit No.:	**P-2016.0006 Project 62178**
Source Type:	**Stationary Concrete Batch Plant**
Manufacturer/Model:	**Con-E-Co / Lo-Pro 12**

Production

Maximum Hourly Production Rate:	220	cy/hr
Proposed Daily Production Rate:	750	cy/day
Proposed Maximum Annual Production Rate:	75000	cy/year

Tons/year

Emissions Units		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs	CO_2e
CBP Type:	**Truck Mix**	0.003	0.01	NA	NA	NA	NA	2.09E-05		N/A
Water Heater #1:	**No water heater**	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00		0
Water Heater #2:	**No water heater**	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00		0
Small Diesel Engine(s) *:	**No Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA		0
Large Diesel Engine *:	**No Large Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA		0
	Annual Totals (T/yr)	**0.00**	**0.01**	**0.00E+00**	**0.00**	**0.00**	**0.00**	**2.09E-05**	**3.09E-05**	**0**

Pounds/hour

		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	**Truck Mix**	0.017	0.03	NA	NA	NA	NA	7.01E-06	
Water Heater #1:	**No water heater**	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00	
Water Heater #2:	**No water heater**	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00	
Small Diesel Engine(s) *:	**No Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA	
Large Diesel Engine*:	**No Large Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA	
	Daily Totals (lb/hr)	**0.02**	**0.03**	**0.00E+00**	**0.00**	**0.00**	**0.00**	**7.01E-06**	**5.21E-05**

* The Large engine may run : **There is no large engine.** hr/yr
* The Small engine(s) may run : **There is no small engine.** hr/yr

HAPS & TAPS Emissions Inventory

Metals	**HAP**	**TAP**	**lb/hr**	**T/yr**	**Averaging Period**	**EL lb/hr**	**Exceeded?**
Arsenic	X	X	6.16E-07	2.70E-06	Annual	1.50E-06	No
Barium		X	0.00E+00	0.00E+00	24-hour	3.30E-02	No
Beryllium	X	X	3.52E-08	1.54E-07	Annual	2.80E-05	No
Cadmium	X	X	4.93E-07	2.16E-06	Annual	3.70E-06	No
Cobalt	X	X	0.00E+00	0.00E+00	24-hour	3.30E-03	No
Copper		X	0.00E+00	0.00E+00	24-hour	1.30E-02	No
Chromium	X	X	1.06E-05	3.14E-06	24-hour	3.30E-02	No
Manganese	X	X	8.25E-06	7.90E-06	24-hour	3.33E-01	No
Mercury	X	X	0.00E+00	0.00E+00	24-hour	N/A	No
Molybdenum (soluble)		X	0.00E+00	0.00E+00	24-hour	3.33E-01	No
Nickel	X	X	1.09E-06	4.76E-06	Annual	2.70E-05	No
Phosphorus	X	X	3.05E-05	8.91E-06	24-hour	7.00E-03	No
Selenium	X	X	3.13E-07	3.76E-07	24-hour	1.30E-02	No
Vanadium		X	0.00E+00	0.00E+00	24-hour	3.00E-03	No
Zinc		X	0.00E+00	0.00E+00	24-hour	6.67E-01	No
Chromium VI	X	X	1.85E-07	8.11E-07	Annual	5.60E-07	No
Non PAH Organic Compunds							
Pentane		X	0.00E+00	0.00E+00	24-hour	118	No
Methyl Ethyl Ketone	X	X	0.00E+00	0.00E+00	24-hour	39.3	No
Non-PAH HAPs							
Acetaldehyde	X	X	0.00E+00	0.00E+00	Annual	3.00E-03	No
Acrolein	X	X	0.00E+00	0.00E+00	24-hour	1.70E-02	No
Benzene	X	X	0.00E+00	0.00E+00	Annual	8.00E-04	No
1,3 - Butadiene	X	X	0.00E+00	0.00E+00	Annual	2.40E-05	No
Ethyl Benzene	X	X	0.00E+00	0.00E+00	24-hour	29	No
Formaldehyde	X	X	0.00E+00	0.00E+00	Annual	5.10E-04	No
Hexane	X	X	0.00E+00	0.00E+00	24-hour	12	No
Methyl Chloroform	X	X	0.00E+00	0.00E+00	24-hour	127	No
Propionaldehyde	X	X	0.00E+00	0.00E+00	24-hour	2.87E-02	No
Quinone	X	X	0.00E+00	0.00E+00	24-hour	2.70E-02	No
Toluene	X	X	0.00E+00	0.00E+00	24-hour	25	No
o-Xylene	X	X	0.00E+00	0.00E+00	24-hour	29	No
PAH HAPs							
2-Methylnaphthalene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
3-Methylcholanthrene	X	X	0.00E+00	0.00E+00	Annual	2.50E-06	No
7,12-Dimethylbenz(a)anthracene	X		0.00E+00	0.00E+00	N/A	N/A	N/A
Acenaphthene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Acenaphthylene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Anthracene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Benzo(a)anthracene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Benzo(a)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(b)fluoranthene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(e)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Benzo(g,h,i)perylene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Benzo(k)fluoranthene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Chrysene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Dibenzo(a,h)anthracene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Dichlorobenzene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Fluoranthene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Fluorene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Indeno(1,2,3-cd)pyrene	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No
Naphthalene (24-hour)	X	X	0.00E+00	0.00E+00	24-hour	3.33	No
Naphthalene (Annual)	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Perylene	X		0.00E+00	0.00E+00	N/A	N/A	N/A
Phenanathrene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
Pyrene	X	X	0.00E+00	0.00E+00	Annual	9.10E-05	No
PAH HAPs Total	X	X	0.00E+00		Annual	2.00E-06	No
Polycyclic Organic Matter (POM)	X	X	0.00E+00	0.00E+00	Annual	2.00E-06	No

Total HAPs Emissions (lb/hr) and (T/yr): 5.21E-05 3.09E-05

Uncontrolled Criteria Pollutants

Source	PM10/PM2.5	SO2	NOx	CO	VOC
	T/yr	T/yr	T/yr	T/yr	T/yr
Concrete Batch Plant	1.58E-01	N/A	N/A	N/A	N/A
Water Heater #1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water Heater #2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Small Diesel Engine	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Large Diesel Engine	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: The emissions from the transfer drop points are the emissions from the material handling

Facility: CD'A Redi Mix
3/22/2019 7:38 Permit P-2016.0006 Project 62178 Facility ID: 055-00125

Internal Combustion Engine > 600 hp (447 kW)

Fuel Type Toggle =	0	
Fuel Consumption Rate	0.00	gal/hr
Calculated MMBtu/hr	0.00	MMBtu/hr
Max Daily Operation	0	hr/day
Max Annual Operation	0	hrs/yr

Rated Power of Large (hp):	0
Not EPA Certified:	No
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Certified EPA Tier 4:	No
Blue Sky Engine:	No

Small Internal Combustion Engine #1 < 600 hp (447 kW)

Fuel Type Toggle =	0	
Fuel Consumption Rate	0.00	gal/hr
Calculated MMBtu/hr	0.00	MMBtu/hr
Max Daily Operation	12	hr/day
Max Annual Operation	0	hrs/yr

Rated Power of Small #1 (hp):	0
Not EPA Certified:	No
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Certified EPA Tier 4:	No
Blue Sky Engine:	No

Small Internal Combustion Engine #2 < 600 hp (447 kW)

Fuel Type Toggle =	0	
Fuel Consumption Rate	0.00	gal/hr
Calculated MMBtu/hr	0.00	MMBtu/hr
Max Daily Operation	12	hr/day
Max Annual Operation	0	hrs/yr

Rated Power of Small #2 (hp):	0
Not EPA Certified:	No
Certified EPA Tier 1:	No
Certified EPA Tier 2:	No
Certified EPA Tier 3:	No
Certified EPA Tier 4:	No
Blue Sky Engine:	No

Conversion Factors:

Avg brake-specific fuel consumption (@ 50°C) =	7000	Btu/hp-hr
1 hp =	0.746	kW
1 lb =	453.592	g

g/kW-hr x (lb/453g) x (hp-hr/7000 Btu) x (0.746 kW/hp) x 10^6 Btu/MMBtu = lb/MMBtu
g/kW-hr x 0.23486 = lb/MMBtu

Pollutant:	NOx	VOC (total TOC --> VOCs)		CO	PM=PM10
EMISSION FACTORS USED FOR SMALL ENGINE (lb/MMBtu):	0.00	0.00		0.00	0.000
Pollutant:	**NOx**	**VOC (total TOC --> VOCs)**		**CO**	**PM=PM10**
EMISSION FACTORS USED FOR LARGE ENGINE (lb/MMBtu):	0.00	0.00		0.00	0.000

AP-42, 3.4 (10/96) EMISSION FACTORS (diesel fueled, uncontrolled)

Pollutant:	NOx	VOC (total TOC --> VOCs)		CO	PM10
Emission Factor (lb/MMBtu)	0	0		0.00	0
Emission Factor (g/kW-hr))	0.00	0.00		0.00	0.00

AP-42, Ch 3.3 (10/96) EMISSION FACTORS (diesel fueled, uncontrolled)

Pollutant:	NOx	VOC (total TOC --> VOCs)		CO	PM10
Emission Factor (lb/MMBtu)	4.41	0.36		0.95	0.31
Emission Factor (g/kW-hr))	18.78	1.53		4.05	1.32

Note: Rating for AP-42 PM10 EF of 0.0573 is "E" or Poor. Used Tier 1 PM EF and presumed PM = PM10

40 CFR 89 and 1039, EPA CERTIFIED GENERATOR EMISSION FACTORS (g/kW-hr converted to lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM = PM10
kW < 8	1	0	2000	0.0	0.36	2.47	1.88	0.23
kW < 8	2	0	2005	0.00	0.36	1.76	1.88	0.19
kW < 8	4	0	2008	0.00	0.36	1.76	1.88	0.09
kW < 8	BlueSky	0	n/a	0.00	0.36	1.06	1.88	0.11
8 ≤ kW < 19	1	0	2000	0.00	0.36	2.23	1.55	0.19
8 ≤ kW < 19	2	0	2005	0.00	0.36	1.76	1.55	0.19
8 ≤ kW < 19	4	0	2008	0.00	0.36	1.76	1.55	0.09
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.36	1.06	1.55	0.11
19 ≤ kW < 37	1	0	1999	0.00	0.36	2.23	1.29	0.19
19 ≤ kW < 37	2	0	2004	0.00	0.36	1.76	1.29	0.14
19 ≤ kW < 37	4	0	2008	0.00	0.36	1.10	1.29	0.007
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.36	1.06	1.29	0.085
37 ≤ kW < 75	1	0	1998	2.16	0.36	0.00	---	---
37 ≤ kW < 75	2	0	2004	0.00	0.36	1.76	1.17	0.09
37 ≤ kW < 75	3	0	2008	0.00	0.36	1.10	1.17	0.09
37 ≤ kW < 75	4	0	2008	0.00	0.36	1.10	1.17	0.007
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.36	1.10	1.17	0.056
75 ≤ kW < 130	1	0	1997	2.16	0.36	0.00	---	---
75 ≤ kW < 130	2	0	2003	0.00	0.36	1.55	1.17	0.07
75 ≤ kW < 130	3	0	2007	0.00	0.36	0.94	1.17	0.07
75 ≤ kW < 130	4	0	2008	0.09	0.04	0.00	1.17	0.005
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.36	0.94	1.17	0.042
130 ≤ kW < 225	1	0	1999	2.16	0.31	0.00	2.68	0.13
130 ≤ kW < 225	2	0	2003	0.00	0.31	1.55	0.82	0.05
130 ≤ kW < 225	3	0	2006	0.00	0.31	0.94	0.82	0.05
130 ≤ kW < 560	4	0	2008	0.09	0.04	0.00	0.82	0.005
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.31	0.94	0.82	0.028
225 ≤ kW < 450	1	0	1996	2.16	0.31	0.00	2.68	0.13
225 ≤ kW < 450	2	0	2001	0.00	0.31	1.50	0.82	0.05
225 ≤ kW < 450	3	0	2006	0.00	0.31	0.94	0.82	0.05
450 ≤ kW ≤ 560	1	0	1996	2.16	0.31	0.00	2.68	0.13
450 ≤ kW ≤ 560	2	0	2002	0.00	0.31	1.50	0.82	0.05
450 ≤ kW ≤ 560	3	0	2006	0.00	0.31	0.94	0.82	0.05
kW > 560	1	0	2000	2.16	0.31	0.00	2.68	0.13
kW > 560	2	0	2006	0.00	0.31	1.50	0.82	0.05
kW > 560	BlueSky	0	n/a	0.00	0.31	0.89	0.82	0.028

40 CFR 89 and 1039, EPA CERTIFIED GENERATOR EMISSION FACTORS FOR LARGE ENGINE (lb/MMBtu)

Rated Power (kW)	Tier	Applicable?	Model Year[1]	NOx	HC	NMHC + NOx	CO	PM10
kW< 8	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW< 8	2	0	2005	0.00	0.00	0.00	0.00	0.00
kW< 8	4	0	2008	0.00	0.00	0.00	0.00	0.00
kW< 8	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	1	0	2000	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	2	0	2005	0.00	0.00	0.00	0.00	0.00
8 < kW < 19	4	0	2008	0.00	0.00	0.00	0.00	0.00
8 ≤ kW < 19	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	1	0	1999	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	2	0	2004	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	4	0	2008	0.00	0.00	0.00	0.00	0.00
19 ≤ kW < 37	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	1	0	1998	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	2	0	2004	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	3	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	4	0	2008	0.00	0.00	0.00	0.00	0.00
37 ≤ kW < 75	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	1	0	1997	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	2	0	2003	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	3	0	2007	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	4	0	2008	0.00	0.00	0.00	0.00	0.00
75 ≤ kW < 130	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	1	0	1996	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	2	0	2003	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 225	3	0	2006	0.00	0.00	0.00	0.00	0.00
130 ≤ kW < 560	4	0	2008	0.00	0.00	0.00	0.00	0.00
130 ≤ kW ≤ 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	1	0	1996	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	2	0	2001	0.00	0.00	0.00	0.00	0.00
225 ≤ kW < 450	3	0	2006	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	1	0	1996	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	2	0	2002	0.00	0.00	0.00	0.00	0.00
450 ≤ kW ≤ 560	3	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	1	0	2000	0.00	0.00	0.00	0.00	0.00
kW > 560	2	0	2006	0.00	0.00	0.00	0.00	0.00
kW > 560	BlueSky	0	n/a	0.00	0.00	0.00	0.00	0.00

DEQ ASSUMPTIONS

DEQ assumptions for the "Drum Dryer UsedOil FabricFilter" Calculations
1. Drum Dryer may be either counter-flow or parallel flow (AP-42 specifies no diference in emissions from either type).
2. SO2 emissions are based on the sulfur content and the Scavenging Factor (varies from 50 to 97%). DEQ used a scavenging factor of 63%. The sulfur content of the three waste oil source tests averaged 0.44 % by weight.

DEQ assumptions for the "Drum Dryer NG FabricFilter" Calculations

DEQ assumptions for the "Drum Dryer #2 Oil FabricFilter" Calculations
1. SO2 emissions are based on the sulfur content and the Scavenging Factor (varies from 50 to 97%). DEQ used a scavenging factor of 63%. The sulfur content of the three waste oil source tests averaged 0.44 % by weight.

DEQ assumptions for the "Drum Dryer LPGProp FabricFilter" Calculations

DEQ assumptions for the "TankHtr #2 Oil-AP42 1.3,11.1" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "Tank Heater NG-AP42 11.1" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "Tank Heater NG-AP42 1.4" Calculations
1. VOC and TAPs emissions from the asphaltic oil storage tank were determined using Tanks 4.0.9d and the Working and Breathing losses were negligible (less than 1% of total VOC emissions).

DEQ assumptions for the "SiloFill Criteria&TAPs" Calculations
1. All PM10 is assumed to be PM2.5.

CURRENT PTC APPLICATION VALUES

DEQ Verification Worksheets: Hot Mix Asphalt (HMA) Drum Mix Facility Data

Facility ID/AIRS No.	055-00125	Spreadsheet Date	3/22/2019 7:41
Permit No.	P-2016.0006	DEQ Version Date	8/2/2018
Facility Owner/Company Name:	CD'A Redi Mix		
Address:	6399 W Bedrock Rd		
City, State, Zip:	Post Falls, ID 83854		
Facility Contact:	Robert Moore		
Contact Number/ e-mail:	~~208-930-2560~~ 7 robertm@cdapaving.com		
		Include Silo Fill & Loadout Emissions?	Y
Use Short Term Source Factor on 586 ELs? Y/N	N	Use T-RACT on 586 AACC? Y/N	N
Hot Mix Plant AP-42 Section 11.1	**Input (Bold Color) or Calculated Value (Black)**	**Fuel Type(s)**	**Fuel Type Toggle ("0" or "1")**
Drum Dryer Make/Model	TBD	Distallate (#2) Fuel Oil	0
Rated heat input capacity, MMBtu/hr	108	Used Oil or RFO4 Oil	0
Drum Dryer Hourly HMA Production, Tons/hour	350	Natural Gas	1
Max Production Per day, Tons per day	3,500	LPG or Propane	0
Max Annual HMA Production, Tons/year	150,000	Default #2 fuel oil and used oil sulfur content percentage by weight	0.0015% and 0.5%
Min Hours of operation per year (annual/max hourly production)	429	#2 Fuel Oil Max Sulfur Content	0.0015%
		Used Oil/RFO4 Oil Max Sulfur Content	0.5000%

Asphaltic Oil Tank Heater AP-42, Section 11.1 (oil or natural gas fuel), or Section 1.4 (natural gas fuel)			
Rated heat input capacity, MMBtu/hr	1.800	**Fuel Type(s)**	**Fuel Toggle**
Hours of operation per day	8	#2 Fuel Oil	0
Operation, days per year (DEQ Assumption)	500.00	Fuel oil sulfur content	0.500%
Max Hours of operation per year (DEQ Assumption)	4,000	Natural Gas	1

Asphaltic Oil Tank Heater Fuel Consumption Calculations	**#2 Fuel Oil**	**Natural Gas**
Heat Input Rating, MMBtu/hr	1.800	1.800
Fuel Heating Value, Btu/gal (oil) or Btu/scf (gas)	137,030	1,020
Heating Value Correction for Natural Gas EFs, see Note	n/a	1.000
Theoretical Max Fuel Use Rate gal/hr [oil] or scf/hr [gas]	13.14	1,765
Max Operational Hours per Year	4,000	4,000
Note: AP-42 EFs for natural gas and diesel combustion are based on heat value of 1,020 Btu/scf and 137,030 Btu/gal		

IC Engine EI Conversion Factors			
1 hp = 0.7456999 kW	0.7457	1 lb = (g)	453.59
Avg brake-specific fuel consumption (BSFC) = 7000 Btu/hp-hr	7000	Fuel Heating Value, Btu/gal	137,030
Note: AP-42 Tables 3.3-x,3.4-x: avg. diesel heating value is based on 19,300 Btu/lb with density equal 7.1 lb/gal=> Btu/gal =			137,030

NOTE: THE HMA EI SUMMARY WORKSHEETS ONLY ALLOWS ONE SMALL AND/OR ONE LARGE IC ENGINE.

IC Engine 1 < 600 bhp (447 kW) AP-42 Section 3.3 (diesel fueled)			
IC Engine Make/Model	make/model	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Year Manufactured (yyyy)	XX	#2 Fuel Oil (Diesel)	1
IC Engine Max Rated Power (bhp)	0	Max Sulfur weight percentage	0.0015%
IC Engine Max Rated Capacity (kW)	0	Max Operational Hours/Day	24
		Max Operational Hours/Year	3,000
IC Engine 1 EPA Certification:	0	Calculated Max Fuel Use Rate, gal/hr	0.00
Not EPA-certified: Enter "0" (zero)		Calculated MMBtu/hr	0.00
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4			
Certified "BLUE SKY" engine: Enter 5			

ERROR - IC ENGINE 2 RATING IS LESS THAN 600 bhp

IC Engine 2 > 600 bhp (447 kW) AP-42 Section 3.4 (diesel fueled)			
IC Engine Make/Model	make/model	**Fuel Type(s)**	**IC Engine Toggle**
IC Engine Year Manufactured (yyyy)	XX	#2 Fuel Oil (Diesel)	1
IC Engine Rated Capacity (bhp)	0	Max Sulfur weight percentage	0.0015%
IC Engine Max Rated Capacity (kW)	0	Max Operational Hours per Day	0
		Max Operational Hours per Year	0
IC Engine 2 EPA Certification:	0	Calculated Max Fuel Use Rate, gal/hr	0.00
Not EPA-certified: Enter "0" (zero)		Calculated MMBtu/hr	0.00
Certified Tier I, Tier 2, Tier 3, or Tier 4: Enter 1, 2, 3, or 4			
Certified "BLUE SKY" engine: Enter 5			

Aggregate Handling - Fugitive Emissions		
U = mean wind speed (miles per hour)	10	
Moisture/Control % Considerations:		
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%		
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% -->		
		--> ~91.3% control for screening, ~95% control for con
M = moisture content (%)	3	Bulk aggregate for HMAstypically stabilizes at 3 to 5% by weight.
If higher moisture is maintained, apply additional % control:	90.00%	For M=3% add 10% control. For M=5% add 15% control. 90% con
Number of front-end loader drop points (aggregate and RAP) (DEQ Assumption)	2	Drops to storage pile(s) and drop(s) to bins
Aggregate weigh conveyor transfer points (DEQ Assumption)	2	Transfer from bins to conveyor & from conveyor to scalping screen

Facility: CD'A Redi Mix
3/22/2019 7:41 **Permit/Facility ID:** P-2016.0006 055-00125

Used Oil Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle = 0
Max Hourly Production 350 T/hr
Max Daily Production 3,500 Tons/day
Max Annual Production 150,000 Tons/yr

User Input Weight % Sulfur = 0.5000%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 1.00

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b]	0.033	0.00	0.00	
PM-10 (total) [b]	0.023	0.00	0.00	
PM-2.5 [b1]	0.0223	0.00	0.00	
CO [c]	0.13	0.00	0.00	
NOx [c]	0.055	0.00	0.00	
SO_2 [c]	0.089	0.00	0.00	
VOC [d]	0.032	0.00	0.00	
Lead	1.50E-05	0.00E+00	0.00E+00	
HCl [d,e]	0.00021	0	0.00E+00	
Dioxins[e,f]				
2,3,7,8-TCDD	2.10E-13	0.00E+00	0.00E+00	0.00E+00
Total TCDD	9.30E-13	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-PeCDD	3.10E-13	0.00E+00	0.00E+00	0.00E+00
Total PeCDD	2.20E-11	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8-HxCDD	4.20E-13	0.00E+00	0.00E+00	0.00E+00
1,2,3,6,7,8-HxCDD	1.30E-12	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8,9-HxCDD	9.80E-13	0.00E+00	0.00E+00	0.00E+00
Total HxCDD	1.20E-11	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	0.00E+00	0.00E+00	0.00E+00
Total HpCDD	1.90E-11	0.00E+00	0.00E+00	0.00E+00
Octa CDD	2.50E-11	0.00E+00	0.00E+00	0.00E+00
Total PCDD[h]	7.90E-11	0.00E+00	0.00E+00	0.00E+00
Furans[e,f]				
2,3,7,8-TCDF	9.70E-13	0.00E+00	0.00E+00	0.00E+00
Total TCDF	3.70E-12	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-PeCDF	4.30E-12	0.00E+00	0.00E+00	0.00E+00
2,3,4,7,8-PeCDF	8.40E-13	0.00E+00	0.00E+00	0.00E+00
Total PeCDF	8.40E-11	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8-HxCDF	4.00E-12	0.00E+00	0.00E+00	0.00E+00
1,2,3,6,7,8-HxCDF	1.20E-12	0.00E+00	0.00E+00	0.00E+00
2,3,4,6,7,8-HxCDF	1.90E-12	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8,9-HxCDF	8.40E-12	0.00E+00	0.00E+00	0.00E+00
Total HxCDF	1.30E-11	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-HpCDF	6.50E-12	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8,9-HpCDF	2.70E-12	0.00E+00	0.00E+00	0.00E+00
Total HpCDF	1.00E-11	0.00E+00	0.00E+00	0.00E+00
Octa CDF	4.80E-12	0.00E+00	0.00E+00	0.00E+00
Total PCDF[h]	4.00E-11	0.00E+00	0.00E+00	0.00E+00
Total PCDD/PCDF[h]	1.20E-10	0.00E+00	0.00E+00	0.00E+00
Non-PAH HAPs[f]				
Acetaldehyde[e]	1.30E-03	0.00E+00	0.00E+00	0.00E+00
Acrolein[e]	2.60E-05	0.00E+00	0.00E+00	0.00E+00
Benzene[e]	3.90E-04	0.00E+00	0.00E+00	0.00E+00
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	0.00E+00
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]	2.00E-05	0.00E+00	0.00E+00	0.00E+00
Pentane[e]				
Propionaldehyde[e]	1.30E-04	0.00E+00	0.00E+00	0.00E+00
Quinone[e]	1.60E-04	0.00E+00	0.00E+00	0.00E+00
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	2.90E-03	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		0.00E+00

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.70E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene	2.20E-05	0.00E+00	0.00E+00	0.00E+00
Anthracene	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(g,h,i)perylene	4.00E-08	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	0.00E+00
Chrysene	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	0.00E+00
Fluorene	1.10E-05	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	0.00E+00
Naphthalene[e]	6.50E-04	0.00E+00	0.00E+00	0.00E+00
Perylene	8.80E-09	0.00E+00	0.00E+00	0.00E+00
Phenanthrene	2.30E-05	0.00E+00	0.00E+00	0.00E+00
Pyrene	3.00E-06	0.00E+00	0.00E+00	0.00E+00
Non-HAP Organic Compounds[f]				
Acetone[e]	8.30E-04	0.00E+00	0.00E+00	0.00E+00
Benzaldehyde	1.10E-04	0.00E+00	0.00E+00	0.00E+00
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde	1.60E-04	0.00E+00	0.00E+00	0.00E+00
Crotonaldehyde[e]	8.60E-05	0.00E+00	0.00E+00	0.00E+00
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal	1.10E-04	0.00E+00	0.00E+00	0.00E+00
Isovaleraldehyde	3.20E-05	0.00E+00	0.00E+00	0.00E+00
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde[e]	6.70E-05	0.00E+00	0.00E+00	0.00E+00
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	0.00E+00
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	0.00E+00
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	0.00E+00
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.60E-06	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	0.00E+00
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.

Pollutants shown in bold/blue text are emitted when using Used Oil but not when using #2 Fuel Oil or Natural Gas.
Pollutants shown in magenta are emitted when using Used Oil or #2 Fuel Oil, but not when using Natural Gas

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

Facility: **CD'A Redi Mix**
3/22/2019 7:41 **Permit/ Facility ID: P-2016.0006 055-00125**

Natural Gas Fired Drum Mix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle = 1
Max Hourly Production 350 Tons/hr
Max Daily Production 3,500 Tons/day
Max Annual Production 150,000 Tons/yr (Proposed Throughput Limit)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	11.55	2.48	
PM-10 (total)[b]	0.023	8.05	1.73	
PM-2.5 [b1]	0.0223	7.81	1.67	
CO [c]	0.13	45.50	9.75	
NOx [c]	0.026	9.10	1.95	
SO_2 [c]	0.0034	1.19	0.26	
VOC [d]	0.032	11.20	2.40	
Lead	6.20E-07	2.17E-04	4.65E-05	
HCl [d,e]	No Data			
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	1.37E-01	2.93E-02	**6.68E-03**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	8.40E-02	1.80E-02	3.50E-02
Formaldehyde[e]	3.10E-03	1.09E+00	2.33E-01	**5.31E-02**
Hexane[e]	9.20E-04	3.22E-01	6.90E-02	1.34E-01
Isooctane	4.00E-05	1.40E-02	3.00E-03	5.83E-03
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	1.68E-02	3.60E-03	7.00E-03
Toluene[e]	1.50E-04	5.25E-02	1.13E-02	2.19E-02
Xylene[e]	2.00E-04	7.00E-02	1.50E-02	2.92E-02
POM (7-PAH Group)		3.97E-02		**1.94E-03**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPS Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	2.59E-02	5.55E-03	**1.27E-03**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	4.90E-04	1.05E-04	**2.40E-05**
Acenaphthylene	8.60E-06	3.01E-03	6.45E-04	**1.47E-04**
Anthracene	2.20E-07	7.70E-05	1.65E-05	**3.77E-06**
Benzo(a)anthracene	2.10E-07	7.35E-05	1.58E-05	**3.60E-06**
Benzo(a)pyrene[e]	9.80E-09	3.43E-06	7.35E-07	**1.68E-07**
Benzo(b)fluoranthene	1.00E-07	3.50E-05	7.50E-06	**1.71E-06**
Benzo(e)pyrene	1.10E-07	3.85E-05	8.25E-06	**1.88E-06**
Benzo(g,h,i)perylene	4.00E-08	1.40E-05	3.00E-06	**6.85E-07**
Benzo(k)fluoranthene	4.10E-08	1.44E-05	3.08E-06	**7.02E-07**
Chrysene	1.80E-07	6.30E-05	1.35E-05	**3.08E-06**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	2.14E-04	4.58E-05	**1.04E-05**
Fluorene	3.80E-06	1.33E-03	2.85E-04	**6.51E-05**
Indeno(1,2,3-cd)pyrene	7.00E-09	2.45E-06	5.25E-07	**1.20E-07**
Naphthalene[e]	9.00E-05	3.15E-02	6.75E-03	**1.54E-03**
Perylene	8.80E-09	3.08E-06	6.60E-07	**1.51E-07**
Phenanthrene	7.60E-06	2.66E-03	5.70E-04	**1.30E-04**
Pyrene	5.40E-07	1.89E-04	4.05E-05	**9.25E-06**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	2.35E-01	5.03E-02	9.77E-02
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	2.45E+00	5.25E-01	1.02E+00
Heptane	9.40E-03	3.29E+00	7.05E-01	1.37E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	1.40E+00	3.00E-01	5.83E-01
2-Methyl-2-butene	5.80E-04	2.03E-01	4.35E-02	8.46E-02
3-Methylpentane	1.90E-04	6.65E-02	1.43E-02	2.77E-02
1-Pentene	2.20E-03	7.70E-01	1.65E-01	3.21E-01
n-Pentane	2.10E-04	7.35E-02	1.58E-02	3.06E-02
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	6.30E-05	1.35E-05	2.63E-05
Arsenic[e]	5.60E-07	1.96E-04	4.20E-05	**9.59E-06**
Barium[e]	5.80E-06	2.03E-03	4.35E-04	8.46E-04
Beryllium[e]				
Cadmium[e]	4.10E-07	1.44E-04	3.08E-05	**7.02E-06**
Chromium[e]	5.50E-06	1.93E-03	4.13E-04	8.02E-04
Cobalt[e]	2.60E-08	9.10E-06	1.95E-06	3.79E-06
Copper[e]	3.10E-06	1.09E-03	2.33E-04	4.52E-04
Hexavalent Chromium[e]	4.50E-07	1.58E-04	3.38E-05	**7.71E-06**
Manganese[e]	7.70E-06	2.70E-03	5.78E-04	1.12E-03
Mercury[e]	2.40E-07	8.40E-05	1.80E-05	3.50E-05
Molybdenum[e]				
Nickel[e]	6.30E-05	2.21E-02	4.73E-03	**1.08E-03**
Phosphorus[e]	2.80E-05	9.80E-03	2.10E-03	4.08E-03
Silver[e]	4.80E-07	1.68E-04	3.60E-05	7.00E-05
Selenium[e]	3.50E-07	1.23E-04	2.63E-05	5.10E-05
Thallium[e]	4.10E-09	1.44E-06	3.08E-07	5.98E-07
Vanadium[e]				
Zinc[e]	6.10E-05	2.14E-02	4.58E-03	8.90E-03

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: **CD'A Redi Mix**
3/22/2019 7:41 **Permit/Facility ID: P-2016.0006 055-00125**

#2 Fuel Oil Fired Drum M ix Asphalt Plant With Fabric Filter AP-42 Section 11.1

Fuel Type Toggle = 0
Hourly Production 350 T/hr
Daily Production 3,500 Tons/day
Max Annual Production 150,000 Tons/yr

User Input Weight % Sulfur = 0.0015%
AP-42 EF of 0.058 lb SO2/ton presumed based on #2 oil, max 0.5% sulfur content
SO2 emissions are multiplied by a factor: User Input Value/0.5% = 0.003

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr) Maximum	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total) [b]	0.033	0.00	0.00	
PM-10 (total) [b]	0.023	0.00	0.00	
PM-2.5 [b1]	0.0223	0.00	0.00	
CO [c]	0.13	0.00	0.00	
NOx [c]	0.055	0.00	0.00	
SO_2 [c]	0.089	0.00	0.00	
VOC [d]	0.032	0.00	0.00	
Lead	1.50E-05	0.00E+00	0.00E+00	
HCl [d,e]	No Data			
Dioxins[e]				
2,3,7,8-TCDD	2.10E-13	0	0.00E+00	**0.00E+00**
Total TCDD	9.30E-13	0	0.00E+00	**0.00E+00**
1,2,3,7,8-PeCDD	3.10E-13	0	0.00E+00	**0.00E+00**
Total PeCDD	2.20E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,7,8-HxCDD	4.20E-13	0	0.00E+00	**0.00E+00**
1,2,3,6,7,8-HxCDD	1.30E-12	0	0.00E+00	**0.00E+00**
1,2,3,7,8,9-HxCDD	9.80E-13	0	0.00E+00	**0.00E+00**
Total HxCDD	1.20E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,6,7,8-Hp-CDD	4.80E-12	0	0.00E+00	**0.00E+00**
Total HpCDD	1.90E-11	0	0.00E+00	**0.00E+00**
Octa CDD	2.50E-11	0	0.00E+00	**0.00E+00**
Total PCDD[h]	7.90E-11	0	0.00E+00	**0.00E+00**
Furans[e]				
2,3,7,8-TCDF	9.70E-13	0	0.00E+00	**0.00E+00**
Total TCDF	3.70E-12	0	0.00E+00	**0.00E+00**
1,2,3,7,8-PeCDF	4.30E-12	0	0.00E+00	**0.00E+00**
2,3,4,7,8-PeCDF	8.40E-13	0	0.00E+00	**0.00E+00**
Total PeCDF	8.40E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,7,8-HxCDF	4.00E-12	0	0.00E+00	**0.00E+00**
1,2,3,6,7,8-HxCDF	1.20E-12	0	0.00E+00	**0.00E+00**
2,3,4,6,7,8-HxCDF	1.90E-12	0	0.00E+00	**0.00E+00**
1,2,3,7,8,9-HxCDF	8.40E-12	0	0.00E+00	**0.00E+00**
Total HxCDF	1.30E-11	0	0.00E+00	**0.00E+00**
1,2,3,4,6,7,8-HpCDF	6.50E-12	0	0.00E+00	**0.00E+00**
1,2,3,4,7,8,9-HpCDF	2.70E-12	0	0.00E+00	**0.00E+00**
Total HpCDF	1.00E-11	0	0.00E+00	**0.00E+00**
Octa CDF	4.80E-12	0	0.00E+00	**0.00E+00**
Total PCDF[h]	4.00E-11	0	0.00E+00	**0.00E+00**
Total PCDD/PCDF[h]	1.20E-10	0	0.00E+00	**0.00E+00**
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	2.90E-03	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr) Maximum	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	0.00017	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	2.20E-05	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	3.10E-06	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,I)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	1.10E-05	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	0.00065	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	2.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	3.00E-06	0.00E+00	0.00E+00	**0.00E+00**
Non-HAP Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.60E-06	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
In addition, for SO2 emissions the AP-42 EF of 0.058 lb/ton was adjusted twice. First, to account for the average sulfur content of the fuel used during the source test (0.44% by weight, three tests on waste oil), 0.058 to 0.066. Second, to account for the average scavenging factor of 63% down to 50%, 0.062 to 0.089.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04
h) Compound is classified as polycyclic organic matter, as defined in the 1990 CAAA. Total PCDD is the sum of the total tetra through octa dioxins; total PCDF is sum of the total tetra through octa furans; and total PCDD/PCDF is the sum of total PCDD and total PCDF.

TAPs lb/hr rates are 24-hr average s except for those in bol d text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: **CD'A Redi Mix**
3/22/2019 7:41 **Permit/ Facility ID: P-2016.0006 055-00125**

LPG or Propane Fired Drum Mix Asphalt Plant With Fabric Filter

Fuel Type Toggle =	0	
Max Hourly Production	350	Tons/hr
Max Daily Production	3,500	Tons/day
Max Annual Production	150,000	Tons/yr

Note: Presumes same emissions as natural gas except for NOx (see AP-42, Section 1.5, Liquefied Petroleum Gas Combustion) SO2 emissions from natural gas are ~70% lower than with #2 Fuel Oil, and ~94% lower than with Used Oil or #6 Fuel Oil (minimal impact on emissions, used Nat Gas EF)

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	0.033	0.00	0.00	
PM-10 (total)[b]	0.023	0.00	0.00	
PM-2.5 [b1]	0.0223	0.00	0.00	
CO [c]	0.13	0.00	0.00	
NOx [c1] (Natural Gas EF x 1.5)	0.039	0.00	0.00	
SO_2 [c]	0.0034	0.00	0.00	
VOC [d]	0.032	0.00	0.00	
Lead	6.20E-07	0	0.00E+00	
HCl [d,e]	No Data			
Dioxins[e]				
-- No EFs for LP Gas or Propane Fuel --				
Furans[e]				
-- No EFs for LP Gas or Propane Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]	3.90E-04	0.00E+00	0.00E+00	**0.00E+00**
1,3-Butadiene[e]				
Ethylbenzene[e]	2.40E-04	0.00E+00	0.00E+00	0.00E+00
Formaldehyde[e]	3.10E-03	0.00E+00	0.00E+00	**0.00E+00**
Hexane[e]	9.20E-04	0.00E+00	0.00E+00	0.00E+00
Isooctane	4.00E-05	0.00E+00	0.00E+00	0.00E+00
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]	4.80E-05	0.00E+00	0.00E+00	0.00E+00
Toluene[e]	1.50E-04	0.00E+00	0.00E+00	0.00E+00
Xylene[e]	2.00E-04	0.00E+00	0.00E+00	0.00E+00
POM (7-PAH Group)		0.00E+00		**0.00E+00**

Pollutant	Emission Factor[a] (lb/ton)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	7.40E-05	0.00E+00	0.00E+00	**0.00E+00**
3-Methylchloranthrene[e]				
Acenaphthene	1.40E-06	0.00E+00	0.00E+00	**0.00E+00**
Acenaphthylene	8.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Anthracene	2.20E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)anthracene	2.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(a)pyrene[e]	9.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Benzo(b)fluoranthene	1.00E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(e)pyrene	1.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Benzo(g,h,I)perylene	4.00E-08	0.00E+00	0.00E+00	**0.00E+00**
Benzo(k)fluoranthene	4.10E-08	0.00E+00	0.00E+00	**0.00E+00**
Chrysene	1.80E-07	0.00E+00	0.00E+00	**0.00E+00**
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene	6.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Fluorene	3.80E-06	0.00E+00	0.00E+00	**0.00E+00**
Indeno(1,2,3-cd)pyrene	7.00E-09	0.00E+00	0.00E+00	**0.00E+00**
Naphthalene[e]	9.00E-05	0.00E+00	0.00E+00	**0.00E+00**
Perylene	8.80E-09	0.00E+00	0.00E+00	**0.00E+00**
Phenanthrene	7.60E-06	0.00E+00	0.00E+00	**0.00E+00**
Pyrene	5.40E-07	0.00E+00	0.00E+00	**0.00E+00**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane	6.70E-04	0.00E+00	0.00E+00	0.00E+00
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene	7.00E-03	0.00E+00	0.00E+00	0.00E+00
Heptane	9.40E-03	0.00E+00	0.00E+00	0.00E+00
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene	4.00E-03	0.00E+00	0.00E+00	0.00E+00
2-Methyl-2-butene	5.80E-04	0.00E+00	0.00E+00	0.00E+00
3-Methylpentane	1.90E-04	0.00E+00	0.00E+00	0.00E+00
1-Pentene	2.20E-03	0.00E+00	0.00E+00	0.00E+00
n-Pentane	2.10E-04	0.00E+00	0.00E+00	0.00E+00
Valeraldehyde				
Metals[g]				
Antimony[e]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	5.60E-07	0.00E+00	0.00E+00	**0.00E+00**
Barium[e]	5.80E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]				
Cadmium[e]	4.10E-07	0.00E+00	0.00E+00	**0.00E+00**
Chromium[e]	5.50E-06	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	2.60E-08	0.00E+00	0.00E+00	0.00E+00
Copper[e]	3.10E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	4.50E-07	0.00E+00	0.00E+00	**0.00E+00**
Manganese[e]	7.70E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	2.40E-07	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]				
Nickel[e]	6.30E-05	0.00E+00	0.00E+00	**0.00E+00**
Phosphorus[e]	2.80E-05	0.00E+00	0.00E+00	0.00E+00
Silver[e]	4.80E-07	0.00E+00	0.00E+00	0.00E+00
Selenium[e]	3.50E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]	4.10E-09	0.00E+00	0.00E+00	0.00E+00
Vanadium[e]				
Zinc[e]	6.10E-05	0.00E+00	0.00E+00	0.00E+00

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 11.1-3, Particulate Matter Emission Factors for Drum Mix Hot Asphalt Plants, 3/04
b1) AP-42, Table 11.1-4, Summary of Particle Size Distribution for Drum Mix Dryers **(Emission Rating Factor E - "Poor")**
c) AP-42, Table 11.1-7, Emission Factors for CO, CO2, NOx, and SO2 from Drum Mix Hot Asphalt Plants, 3/04
c1) AP-42, Table 1.5-1, Emission Factors for LPG Combustion, note (a): "Assumes emissions (except SOx and NOx) are the same, on a heat input basis, as for natural gas combustion. The NOx emission factors have been multiplied by a factor of 1.5, which is the approximate ration of propane/butane NOx emissions to natural gas NOx emissions.
d) AP-42, Table 11.1-8, Emission Factors for TOC, Methane, VOC, and HCl from Drum Mix Hot Asphalt Plants, 3/04
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 11.1-10, Emission Factors for Organic Pollutant Emissions from Drum Mix Hot Asphalt Plants, 3/04
g) AP-42, Table 11.1-12, Emission Factors for Metal Emissions from Drum Mix Hot Mix Asphalt Plants, 3/04

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

3/22/2019 7:41 **Permit/Facility ID: P-2016.0006 055-00125**

Asphalt Tank Heater - #2 Oil Fired, Estimate d Emissions Using AP-42 Sections 11 .1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Fuel Type Toggle = 0
Fuel Consumption Rate 13.14 gal/hr
Max Daily Operation 8 hr/day
Max Annual Operation 4,000 hrs/yr

User Input Weight % Sulfur = 0.5000%
AP-42 1.3-1 EF is 0.142S lb SO2 per gallon of fuel oil

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b] (filterable+cond)	0.0033	0.00E+00	0.00	
PM-10 (total)[b] (filterable+cond)	0.0023	0.00E+00	0.00	
PM-2.5 (total)[b] (filterable+cond)	0.00154	0.000	0.00	
CO[b] ("C" EF Rating Factor)	0.005	0.00E+00	0.00	
NOx[b]	0.024	0.00E+00	0.00	
SO_2[b]	0.071	0.00	0.00	
VOC[d] (NMTOC EF)	5.56E-04	0.00E+00	0.00E+00	
Lead[f]	1.51E-06	0.00E+00	0.00E+00	
HCl[e]				
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD[c]	6.90E-13	0.00E+00	0.00E+00	0.00E+00
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD[c]	7.60E-13	0.00E+00	0.00E+00	0.00E+00
Total HxCDD				
1,2,3,4,6,7,8-Hp-CDD[c]	1.50E-11	0.00E+00	0.00E+00	0.00E+00
Total $HpCDD_s$	2.00E-11	0.00E+00	0.00E+00	0.00E+00
Octa CDD[c]	1.60E-10	0.00E+00	0.00E+00	0.00E+00
Total PCDD[c]	2.00E-10	0.00E+00	0.00E+00	0.00E+00
Furans[e]				
2,3,7,8-TCDF				
Total TCDF[c]	3.30E-12	0.00E+00	0.00E+00	0.00E+00
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF[c]	4.80E-13	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF[c]	2.00E-12	0.00E+00	0.00E+00	0.00E+00
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF[c]	9.70E-12	0.00E+00	0.00E+00	0.00E+00
Octa CDF[c]	1.20E-11	0.00E+00	0.00E+00	0.00E+00
Total PCDF[c]	3.10E-11	0.00E+00	0.00E+00	0.00E+00
Total PCDD/PCDF[c]	2.30E-10	0.00E+00	0.00E+00	0.00E+00
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	3.50E-06	0.00E+00	0.00E+00	0.00E+00
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
POM (7-PAH Group)		0.00E+00		0.00E+00

Pollutant	Emission Factor[a] (lb/gal)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene[c]	5.30E-07	0.00E+00	0.00E+00	0.00E+00
Acenaphthylene[c]	2.00E-07	0.00E+00	0.00E+00	0.00E+00
Anthracene[c]	1.80E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene[c]	1.00E-07	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a.h)anthracene				
Dichlorobenzene				
Fluoranthene[c]	4.40E-08	0.00E+00	0.00E+00	0.00E+00
Fluorene[c]	3.20E-08	0.00E+00	0.00E+00	0.00E+00
Indeno(1,2,3-cd)pyrene				
Naphthalene[c,e]	1.70E-05	0.00E+00	0.00E+00	0.00E+00
Perylene				
Phenanthrene[c]	4.90E-06	0.00E+00	0.00E+00	0.00E+00
Pyrene[c]	3.20E-08	0.00E+00	0.00E+00	0.00E+00
Non-HAP Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[f]				
Antimony[e]	5.25E-06	0.00E+00	0.00E+00	0.00E+00
Arsenic[e]	1.32E-06	0.00E+00	0.00E+00	0.00E+00
Barium[e]	2.57E-06	0.00E+00	0.00E+00	0.00E+00
Beryllium[e]	2.78E-08	0.00E+00	0.00E+00	0.00E+00
Cadmium[e]	3.98E-07	0.00E+00	0.00E+00	0.00E+00
Chromium[e]	8.45E-07	0.00E+00	0.00E+00	0.00E+00
Cobalt[e]	6.02E-06	0.00E+00	0.00E+00	0.00E+00
Copper[e]	1.76E-06	0.00E+00	0.00E+00	0.00E+00
Hexavalent Chromium[e]	2.48E-07	0.00E+00	0.00E+00	0.00E+00
Manganese[e]	3.00E-06	0.00E+00	0.00E+00	0.00E+00
Mercury[e]	1.13E-07	0.00E+00	0.00E+00	0.00E+00
Molybdenum[e]	7.87E-07	0.00E+00	0.00E+00	0.00E+00
Nickel[e]	8.45E-05	0.00E+00	0.00E+00	0.00E+00
Phosphorus[e]	9.46E-06	0.00E+00	0.00E+00	0.00E+00
Silver[e]				
Selenium[e]	6.83E-07	0.00E+00	0.00E+00	0.00E+00
Thallium[e]				
Vanadium[e]	3.18E-05	0.00E+00	0.00E+00	0.00E+00
Zinc[e]	2.91E-05	0.00E+00	0.00E+00	0.00E+00

a) Emission factors for criteria pollutants are from AP-42, 1.3, Fuel Oil Combustion, 9/98; all other factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04
b) AP-42, Table 1.3-1, Criteria Pollutant Emission Factors for Fuel Oil Combustion, 9/98, Boilers < 100 MMBtu, SOx based on max fuel sulfur content, PM10 is 1.3 lb/1,000 gal + 50% of 2.0 lb/1,000 g
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) AP-42, Table 1.3-3, Emission Factors for Total Organic Compounds (TOC), Methane, and Nonmethane TOC (NMTOC) from Uncontrolled Distillate Fuel Oil Combustion; Commercial Boiler
e) IDAPA Toxic Air Pollutant
f) AP-42, Table 1.3-11, Emission Factors for Metals from Uncontrolled No. 6 Fuel Oil Combustion

TAPs lb/hr rates are 24-hr ave rages except for those in bold text. Lb/hr rates for bold T APs (carcinogens) are annual averages.

Facility: CD'A Redi Mix
3/22/2019 7:41 **Permit/Facility ID:** P-2016.0006 055-00125

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 11.1 (Hot Mix Asphalt Plants)

Fuel Type Toggle = 1
Fuel Consumption Rate 1,765 scf/hr
Max Daily Operation 8 hr/day
Max Annual Operation 4,000 hrs/yr

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PM (total)				
PM-10 (total)				
PM-2.5				
CO [c]	8.90E-06	1.57E-02	3.14E-02	
NOx				
SO_2				
VOC				
Lead				
HCl [e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[e]				
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[c,e]	2.60E-08	4.59E-05	9.18E-05	**2.10E-05**
Hexane[e]				
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[e]				
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[e]				
Xylene[e]				
POM (7-PAH Group)		0.00E+00		0.00E+00

Pollutant	Emission Factor[a] (lb/scf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) **Annual** or 24-hr Average
PAH HAPs				
2-Methylnaphthalene				
3-Methylchloranthrene[e]				
Acenaphthene				
Acenaphthylene				
Anthracene				
Benzo(a)anthracene				
Benzo(a)pyrene[e]				
Benzo(b)fluoranthene				
Benzo(e)pyrene				
Benzo(g,h,i)perylene				
Benzo(k)fluoranthene				
Chrysene				
Dibenzo(a,h)anthracene				
Dichlorobenzene				
Fluoranthene				
Fluorene				
Indeno(1,2,3-cd)pyrene				
Naphthalene[e]				
Perylene				
Phenanthrene				
Pyrene				
Non-HAPs Organic Compounds				
Acetone[e]				
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[e]				
Arsenic[e]				
Barium[e]				
Beryllium[e]				
Cadmium[e]				
Chromium[e]				
Cobalt[e]				
Copper[e]				
Hexavalent Chromium[e]				
Manganese[e]				
Mercury[e]				
Molybdenum[e]				
Nickel[e]				
Phosphorus[e]				
Silver[e]				
Selenium[e]				
Thallium[e]				
Vanadium[e]				
Zinc[e]				

a) Emission factors are from AP-42
b) (reserved)
c) AP-42, Table 11.1-13, Emission Factors for Hot Mix Asphalt Hot Oil Systems, 3/04
d) (reserved)
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: CD'A Redi Mix
3/22/2019 7:41 **Permit/Facility ID:** P-2016.0006 055-00125

Asphalt Tank Heater - Natural Gas Fired, Estimated Emissions Using AP-42 Section 1.4 (Natural Gas Combustion)

Fuel Type Toggle = 1
Fuel Consumption Rate 1,765 scf/hr
Max Daily Operation 8 hr/day
Max Annual Operation 4,000 hrs/yr
Heating Value Correction: 1,000 applied to Emissions (lb/hr, T/yr) calculations

Note: CO EF per AP-42 Table 1.4.1 for natural gas combustion in boilers is 84 lb/MMscf, a factor of 10 higher than the factor shown in Table 11.1-13
Tank heater CO emissions are based on using 84 lb/MMscf

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[c]	7.6	1.34E-02	2.68E-02	
PM-10 (total)[c]	7.6	1.34E-02	2.68E-02	
PM-2.5	7.6	1.34E-02	2.68E-02	
CO [b]	**84**	1.48E-01	2.96E-01	
NO_x [b]	100	1.76E-01	3.53E-01	
SO_2 [c]	0.6	1.06E-03	2.12E-03	
VOC [c]	5.5	9.71E-03	1.94E-02	
Lead [c]	5.00E-04	8.82E-07	1.76E-06	
HCl [e]				
Dioxins[e]				
-- No EFs for Natural Gas Fuel --				
Furans[e]				
-- No EFs for Natural Gas Fuel --				
Non-PAH HAPs[f]				
Acetaldehyde[e]				
Acrolein[e]				
Benzene[c1, e]	2.10E-03	3.71E-06	7.41E-06	**1.69E-06**
1,3-Butadiene[e]				
Ethylbenzene[e]				
Formaldehyde[e]	7.50E-02	1.32E-04	2.65E-04	**6.04E-05**
Hexane[e]	1.80E+00	3.18E-03	6.35E-03	1.06E-03
Isooctane				
Methyl Ethyl Ketone[e]				
Pentane[c1, e]	2.60E+00	4.59E-03	9.18E-03	1.53E-03
Propionaldehyde[e]				
Quinone[e]				
Methyl chloroform[e]				
Toluene[c1, e]	3.40E-03	6.00E-06	1.20E-05	2.00E-06
Xylene[e]				
POM (7-PAH Group)		2.01E-08		**9.19E-09**

Pollutant	Emission Factor[a] (lb/MMscf)	Emissions (lb/hr)	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene[c1]	2.40E-05	4.24E-08	8.47E-08	**1.93E-08**
3-Methylchloranthrene[c1, e]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Acenaphthene[c1]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Acenaphthylene[c1]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Anthracene[c1]	2.40E-06	4.24E-09	8.47E-09	**1.93E-09**
Benzo(a)anthracene[c1]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Benzo(a)pyrene[c1, e]	1.20E-06	2.12E-09	4.24E-09	**9.67E-10**
Benzo(b)fluoranthenec[1]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Benzo(e)pyrene				
Benzo(g,h,i)perylene[c1]	1.20E-06	2.12E-09	4.24E-09	**9.67E-10**
Benzo(k)fluoranthene[c1]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Chrysene[c1]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Dibenzo(a,h)anthracene[c1]	1.20E-06	2.12E-09	4.24E-09	**9.67E-10**
Dichlorobenzene[c1]	1.20E-03	2.12E-06	4.24E-06	**9.67E-07**
Fluoranthene[c1]	3.00E-06	5.29E-09	1.06E-08	**2.42E-09**
Fluorene[c1]	2.80E-06	4.94E-09	9.88E-09	**2.26E-09**
Indeno(1,2,3-cd)pyrene[c1]	1.80E-06	3.18E-09	6.35E-09	**1.45E-09**
Naphthalene[c1, e]	6.10E-04	1.08E-06	2.15E-06	**4.92E-07**
Perylene				
Phenanthrene[c1]	1.70E-05	3.00E-08	6.00E-08	**1.37E-08**
Pyrene[c1]	5.00E-06	8.82E-09	1.76E-08	**4.03E-09**
Non-HAPs Organic Compounds[f]				
Acetone[e]				
Benzaldehyde				
Butane[c1]	2.10E+00	3.71E-03	7.41E-03	1.24E-03
Butyraldehyde				
Crotonaldehyde[e]				
Ethylene				
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-pentene				
2-Methyl-2-butene				
3-Methylpentane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals[e]				
Antimony[e]				
Arsenic[d, e]	2.00E-04	3.53E-07	7.06E-07	**1.61E-07**
Barium[d, e]	4.40E-03	7.76E-06	1.55E-05	2.59E-06
Beryllium[e]	1.20E-05	2.12E-08	4.24E-08	**9.67E-09**
Cadmium[d, e]	1.10E-03	1.94E-06	3.88E-06	**8.86E-07**
Chromium[d, e]	1.40E-03	2.47E-06	4.94E-06	8.24E-07
Cobalt[d, e]	8.40E-05	1.48E-07	2.96E-07	4.94E-08
Copper[d, e]	8.50E-04	1.50E-06	3.00E-06	5.00E-07
Hexavalent Chromium[e]				
Manganese[d, e]				
Mercury[d, e]				
Molybdenum[d, e]	1.10E-03	1.94E-06	3.88E-06	6.47E-07
Nickel[d, e]				
Phosphorus[e]				
Silver[e]				
Selenium[d, e]				
Thallium[e]				
Vanadium[d, e]	2.30E-03	4.06E-06	8.12E-06	1.35E-06
Zinc[d, e]				

a) Emission factors are from AP-42
b) AP-42, Table 1.4-1, Emission Factors for NOx and CO from Natural Gas Combustion, 7/98
c) AP-42, Table 1.4-2, Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion, 7/98
c1) AP-42, Table 1.4-3, Emission Factors for Speciated Organic Compounds from Natural Gas Combustion, 7/98
d) AP-42, Table 1.4-4, Emission Factors for Metals from Natural Gas Combustion, 7/98
e) IDAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: CDA Redi Mix
3/22/2019 7:41 **Permit/Facility ID:** P-2016.0006 055-00125

Silo Filling Operations AP-42 Section 11.1

Emissions Toggle = 1
Max Hourly Production 350 T/hr
Max Daily Production 3,500 Tons/day
Max Annual Production 150,000 Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM (total)[b]	5.26E-04	0.2001	0.0439	
PM 10 (total)[b]	5.26E-04	0.2001	0.0439	
PM 2.5[b]	5.26E-04	0.2001	0.0439	
CO[b]	1.15E-03	0.4100	0.0960	
NO_x				
SO_2				
VOC[c]	1.22E-04	4.27E-02	0.0091	
Lead				
HCl[d]	No Data			
Dioxins[e]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-HpCDD				
Total HpCDD				
Octa CDD				
Total PCDD[e]				
Furans[e]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF[e]				
Total PCDD/PCDF[e]				
Non-PAH HAPs				
Acetaldehyde[f]				
Acrolein[f]				
Benzene[f]	3.90E-06	1.36E-03	2.92E-04	0.0001
1,3-Butadiene[f]				
Ethylbenzene[f]	4.63E-06	1.62E-03	3.47E-04	6.70E-04
Formaldehyde[f]	8.41E-06	2.94E-03	6.31E-04	0.0013
Hexane[f]	1.22E-05	4.27E-03	9.14E-04	1.76E-03
Isooctane	3.76E-06	1.32E-03	2.82E-04	5.51E-04
Methyl Ethyl Ketone[f]	4.75E-06	1.66E-03	3.56E-04	6.90E-04
Pentane[f]				
Propionaldehyde[f]				
Quinone[f]				
Methyl chloride[f]		0.00E+00	0.00E+00	
Toluene[f]	7.30E-06	2.64E-03	5.67E-04	1.10E-03
Xylene[f]	3.13E-05	1.10E-02	2.35E-03	4.57E-03
PDM IT-PAH Group1		2.20E-01		1.18E-05

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[f]				
2-Methylnaphthalene	1.34E-05	4.68E-03	1.00E-03	2.29E-04
3-Methylchloranthrene[g]				
Acenaphthene	1.19E-06	4.15E-04	8.88E-05	2.04E-05
Acenaphthylene	3.55E-06	1.24E-03	2.67E-04	6.09E-05
Anthracene	3.30E-07	1.16E-04	2.48E-05	5.66E-06
Benzo(a)anthracene	1.42E-07	4.96E-05	1.07E-05	2.43E-06
Benzo(a)pyrene[f]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(b)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(e)pyrene	2.41E-06	8.44E-04	1.81E-04	4.13E-05
Benzo(g,h,i)perylene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benzo(k)fluoranthene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chrysene	5.33E-07	1.87E-04	4.00E-05	9.13E-06
Dibenz(a,h)anthracene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dichlorobenzene				
Fluoranthene	3.81E-07	1.33E-04	2.86E-05	6.53E-06
Fluorene	2.50E-06	8.97E-04	1.92E-04	4.39E-05
Indeno(1,2,3-cd)pyrene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Naphthalene[f]	4.63E-06	1.62E-03	3.47E-04	7.91E-05
Perylene	7.83E-06	2.67E-03	5.71E-04	1.30E-04
Phenanthrene	6.57E-06	1.99E-03	3.42E-04	7.83E-05
Pyrene	1.13E-06	3.91E-04	8.38E-05	1.91E-05
Non-HAP Organic Compounds				
Acetone[f]	6.70E-05	2.35E-02	0.0050	9.77E-04
Benzaldehyde				
Butane				
Butanaldehyde				
Crotonaldehyde[f]				
Ethane	1.34E-04	4.69E-02	0.0101	1.95E-02
Heptane				
Hexanal				
Isovaleraldehyde				
2-Methyl-1-heptene				
2-Methyl-2-butene				
3-Methylheptane				
1-Pentene				
n-Pentane				
Valeraldehyde				
Metals				
Antimony[f]				
Arsenic[f]				
Barium[f]				
Beryllium[f]				
Cadmium[f]				
Chromium[f]				
Cobalt[f]				
Copper[f]				
Hexavalent Chromium[f]				
Manganese[f]				
Mercury[f]				
Molybdenum[f]				
Nickel[f]				
Phosphorus[f]				
Silver[f]				
Selenium[f]				
Thallium[f]				
Vanadium[f]				
Zinc[f]				

Facility: CDA Redi Mix
3/22/2019 7:41 **Permit/Facility ID:** P-2016.0006 055-00125

Silo Filling Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle = 0
Max Hourly Production 350 T/hr
Max Daily Production 3,500 Tons/day
Max Annual Production 150,000 Tons/yr

Pollutant	Emission Factor[a] Silo Fill (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (T/yr)	TAPs Emissions (lb/hr) Annual or 24-hr Average
non-PAH HAPs				
Bromomethane[f]	6.97E-07	2.09E-04	0.0000	6.71E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[f]	1.95E-06	6.82E-04	0.0001	2.64E-04
Chloroethane (Ethyl chloride)[f]	4.87E-07	1.71E-04	0.0000	3.11E-05
Chloromethane (Methyl chloride)[f]	2.80E-06	9.81E-04	0.0002	4.00E-04
Cumene[f]				
m-Hexane (see Hexane)[f]				
Methylene chloride (Dichloromethane)[f]	3.29E-06	1.15E-03	2.47E-04	4.90E-05
MTBE				
Styrene[f]	6.50E-07	2.30E-04	4.94E-05	9.00E-06
Tetrachloroethane (Tetrachloroethylene)[f]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform)[f]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethane (Trichloroethylene)[f]				
Trichlorofluoromethane				
m-/p-Xylene[f] (added into Xylene[f])	2.14E-05	8.53E-03	0.0018	3.76E-03
o-Xylene[f] (added into Xylene[f])	8.95E-06	2.43E-03	0.0008	1.91E-03
Phenol[f]				
Non-HAP Organic Compounds				
Methane	3.17E-03	1.11E+00	0.2376	4.82E-01

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

a) Emission factors are from AP-42 11.1, Hot Mix Asphalt Plants, 3/04

b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04. Defaults (-V) = 0.5 T (°F) = 325

	LOADOUT	SILO FILL	
Total PM EF = 0.000181+0.00141(-V)e$^{(0.0251(T+460)-20.43)}$ + 0.00332+ 0.00105(-V)e$^{(0.025(T+460)-20.4}$	=	5.219E-04	5.859E-04 (split addenda)
Organic PM EF = 0.00141(-V)e$^{(0.0251(T+460)-20.43)}$ + 0.00105(-V)e$^{(0.025(T+460)-20.43)}$	=	3.408E-04	2.539E-04 (split addenda)
TOC PM EF = 0.0172(-V)e$^{(0.0251(T+460)-20.43)}$ + 0.0504(-V)e$^{(0.0251(T+460)-20.43)}$	=	4.159E-03	1.219E-02 (split addenda)
CO PM EF = 0.00558(-V)e$^{(0.0251(T+460)-20.43)}$ + 0.00488(-V)e$^{(0.0251(T+460)-20.43)}$	=	1.240E-03	1.160E-03 (split addenda)

e) TOAPA Toxic Air Pollutant

f) AP-42, Table 11.1-15, Speciation Profiles for Load-out, Silo Filling & Asphalt Storage--Organic Particulate-Based Compounds 3/04 (EF=Spec% * Organic PM EF)

g) AP-42, Table 11.1-16, Speciation Profiles for Load-out, Silo Filling & Asphalt Storage--Organic Volatile-Based Compounds, 3/04. (EF=Spec% * TOC PM EF)

Pollutants shown in bold text are carcinogens subject to an annual standard. These lb/hr values are annual averages.

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility: CDA Redi Mix
3/22/2019 7:41 Permit/Facility ID: P-2016.0006 055-00125

Load-out Operations AP-42 Section 11.1

Emissions Toggle = 1
Max Hourly Production 350 Tihr
Max DailyProduction 3,500 Tons/day
Max Annual Production 150,000 Tons/yr

Pollutant	Emission Factor[a] Load-out (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (Tpy)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PM Total[1]	3.22E-04	0.102	0.04	
PM 10 Total[1]	3.22E-04	0.102	0.04	
PM 2.5[1]	3.22E-04	0.102	0.04	
CO[1]	1.35E-03	0.472	0.18	
NOx				
SOx				
VOC[11]	3.91E-03	1.368	0.29	
Lead				
HCl[11]	No Data			
Dioxins[a]				
2,3,7,8-TCDD				
Total TCDD				
1,2,3,7,8-PeCDD				
Total PeCDD				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
Total HxCDD				
1,2,3,4,6,7,8-HpCDD				
Total HpCDD				
Octa CDD				
Total PCDD				
Furans[a]				
2,3,7,8-TCDF				
Total TCDF				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
Total PeCDF				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
Total HxCDF				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
Total HpCDF				
Octa CDF				
Total PCDF				
Total PCDD/PCDF				
Non-PAH HAPs				
Acetaldehyde[a]				
Acrolein[a]				
Benzene[a]	2.10E-05	7.57E-04	1.62E-04	3.78E-05
1,3-Butadiene[a]				
Ethylbenzene[a]	1.19E-05	4.06E-03	8.73E-04	1.70E-03
Formaldehyde[a]	3.89E-04	1.26E-02	2.71E-04	6.27E-05
Hexane[a]	6.24E-05	2.16E-03	4.64E-04	9.10E-04
Isooctane	7.49E-06	2.87E-05	3.61E-06	1.05E-05
Methyl Ethyl Ketone[a]	2.04E-05	7.13E-04	1.53E-04	2.97E-04
Perlene[a]				
Propionaldehyde[a]				
Quinone[a]				
Methyl chloroform[a]				
Toluene[a]	8.73E-05	3.09E-03	6.59E-04	1.27E-03
Xylene[a]	8.03E-05	1.79E-02	3.77E-03	7.34E-03
POM (7 PAH Group)		1.61E-04		7.88E-06

Pollutant	Emission Factor[a] Load-out (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (Tpy)	TAPs Emissions (lb/hr) Annual or 24-hr Average
PAH HAPs[a]				
2-Methylnaphthalene	4.11E-06	2.54E-03	6.19E-04	1.39E-04
3-Methylchloranthrene[a]				
Acenaphthene	4.80E-07	3.10E-04	6.80E-05	1.54E-05
Acenaphthylene	9.55E-07	3.34E-03	7.16E-04	1.61E-04
Anthracene	2.39E-07	8.30E-05	1.79E-05	4.06E-06
Benzo(a)anthracene	6.48E-06	2.27E-03	4.86E-04	1.11E-04
Benzo(a)pyrene[a]	7.84E-06	2.74E-06	5.88E-07	1.34E-07
Benzo(b)fluoranthene	2.59E-06	9.07E-04	1.94E-04	4.44E-07
Benzo(g,h,i)perylene	2.00E-06	3.21E-05	1.39E-05	4.33E-07
Benzo(k)fluoranthene	6.48E-06	2.27E-06	4.86E-07	1.11E-07
Benzo(e)fluoranthene	7.50E-06	2.63E-06	5.63E-07	1.28E-07
Chrysene	3.51E-07	1.23E-04	2.63E-05	6.01E-06
Dibenzo(a,h)anthracene	1.20E-06	4.52E-07	9.60E-08	2.18E-08
Dichlorobenzene				
Fluoranthene	1.70E-07	5.97E-05	1.28E-05	2.92E-06
Fluorene	2.63E-06	9.19E-04	1.97E-04	4.50E-05
Indeno(1,2,3-cd)pyrene	1.60E-06	5.61E-07	1.20E-07	2.74E-08
Naphthalene[a]	4.29E-06	1.49E-03	3.23E-04	7.30E-05
Perylene	7.50E-08	2.63E-05	5.63E-06	1.28E-06
Phenanthrene	2.79E-06	9.87E-04	2.07E-04	4.73E-05
Pyrene	5.11E-07	1.79E-04	3.84E-05	8.76E-06
Non-PAH Organic Compounds				
Acetone[a]	1.85E-05	6.61E-04	1.48E-04	2.84E-04
Benzaldehyde				
Butane				
Butyraldehyde				
Crotonaldehyde[a]				
Ethane	2.90E-05	1.03E-02	2.21E-03	4.21E-03
Heptane				
Hexanal				
Isobutyraldehyde				
2-Methylheptane				
2-Methylhexane				
3-Methylhexane				
Pentane				
Propionaldehyde				
Metals				
Antimony[a]				
Arsenic[a]				
Barium[a]				
Beryllium[a]				
Cadmium[a]				
Chromium[a]				
Cobalt[a]				
Copper[a]				
Hexavalent Chromium[a]				
Manganese[a]				
Mercury[a]				
Molybdenum[a]				
Nickel[a]				
Phosphorus[a]				
Silver[a]				
Selenium[a]				
Thallium[a]				
Vanadium[a]				
Zinc[a]				

a) Emission factors are from AP-42 11.1 Hot Mix Asphalt Plants, 3/04 Defaults: LVS= 0.5 T-(Y)= 325

b) AP-42, Table 11.1-14, Predictive Emission Factor Equations for Load-Out and Silo Filling Operations, 3/04

	LOADOUT	SILO FILL
Total PM EF = 0.000181+0.00141(-V$_g$)$^{(0.0251(T+460)-20.43)}$ + 0.00032+ 0.00105(-V$_g$)$^{(0.0251(T+460)-20.43)}$	= 5.21E-04	5.65E-04 (split addends)
Organic PM EF = 0.00141(-V$_g$)$^{(0.0251(T+460)-20.43)}$ + 0.00105(-V$_g$)$^{(0.0251(T+460)-20.43)}$	= 3.40E-04	2.53E-04 (split addends)
TOC PM EF = 0.0172(-V$_g$)$^{(0.0251(T+460)-20.43)}$ + 0.0504(-V$_g$)$^{(0.0251(T+460)-20.43)}$	= 4.15E-03	1.21E-02 (split addends)
CO PM EF = 0.00556(-V$_g$)$^{(0.0251(T+460)-20.43)}$ + 0.00456(-V$_g$)$^{(0.0251(T+460)-20.43)}$	= 1.34E-03	1.16E-03 (split addends)

c) CAPs Toxic Air Pollutant
d) AP-42, Table 11.1-5, Speciation Profiles for Load-out, Silo Filling & Asphalt Storage - Organic Particulate Based Compounds, 3/04 (EF=Spec% * Organic PM EF)
g) AP-42, Table 11.1-10, Speciation Profiles for Load-out Silo Filling, Asphalt Storage - Organic Vapor Based Compounds 3/04 (EF=Spec% * TOC PM EF)

TAPs lb/hr rates are 24-hr averages except for those in bold to st. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

Facility: CDA Redi Mix
3/22/2019 7:41 Permit/Facility ID: P-2016.0006 055-00125

Load-out Operations AP-42 Section 11.1, Page 2

Fuel Type Toggle = 0
Max Hourly Production 350 Tihr
Max DailyProduction 3,500 Tons/day
Max Annual Production 150,000 Tons/yr

Pollutant	Emission Factor[a] Load-out (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (Tpy)	TAPs Emissions (lb/hr) Annual or 24-hr Average
Non-PAH HAPs				
Bromomethane[a]	3.90E-07	1.48E-04	2.99E-05	3.42E-05
2-Butanone (see Methyl Ethyl Ketone)				
Carbon disulfide[a]	5.41E-07	1.89E-04	4.05E-05	7.66E-05
Chloroethane (Ethyl chloride)[a]	4.79E-09	3.09E-06	8.36E-07	1.27E-06
Chloromethane (Methyl chloride)[a]	6.24E-07	2.16E-04	4.64E-05	9.10E-05
Cumene[a]	4.57E-05	1.85E-03	3.43E-04	6.67E-04
n-Hexane (see Hexane)				
Methylene chloride (Dichloromethane)				
MTBE				
Styrene[a]	3.04E-07	1.05E-04	2.28E-05	4.43E-05
Tetrachloroethene (Tetrachloroethylene)[a]	3.20E-07	1.12E-04	2.40E-05	4.67E-05
1,1,1-Trichloroethane (Methyl chloroform)				
Trichloroethene (Trichloroethylene)[a]				
Trichlorofluoromethane	5.41E-08	1.89E-05	4.05E-06	7.66E-06
m-Xylene[a] (added into Xylene)	1.71E-05	3.87E-03	1.28E-03	2.49E-03
o-Xylene[a] (added into Xylene)	2.33E-05	1.13E-02	2.39E-03	4.45E-03
Phenol[a]	4.03E-06	1.41E-03	3.02E-04	5.87E-04
Non-HAP Organic Compounds				
Methane	2.70E-04	9.45E-02	2.03E-02	3.94E-02

Pollutants shown in blue text are organic volatile-based compounds, EF = Spec% x TOC PM EF.

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: **CD'A Redi Mix**
3/22/2019 7:41 **Permit/Facility ID:** **P-2016.0006** **055-00125**

Max Hourly Production	350 T/hr		96% T/hr is Aggregate & RAP =	**336 T/hr**
Max Daily Production	3,500 Tons/day		96% T/day is Aggregate & RAP =	**3,360 T/day**
Max Annual Production	150,000 Tons/yr		96% T/yr is Aggregate & RAP =	**144,000 T/yr**

Fine PM emitted from RAP use is negligible (see assumptions on page 1 of this spreadsheet). Worst case emissions are for 0% RAP

Aggregate Front-end Loader Drop Points, AP-42 13.2.4 (11/06)

$E = k\ (0.0032) \times (U/5)^{1.3} / (M/2)^{1.4}$ = 3.31E-03 for PM 1.56E-03 lb/ton for PM10 2.37E-04 lb/ton for PM2.5

k = particle size multiplier	0.74 for PM	0.35 for PM10	0.053 for PM2.5
U = mean wind speed =	**10 mph**	Wind speed range for source conditions for Equation 1: 1.3 to 15 mph. Select 10 mph as base case wind speed.	
M = moisture content =	**3 %**		

Moisture Content: STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996: Aggregate moisture content into dryer typically 3 to 7 %
BAAQMD, Hot Mixing Asphalt Facilities, Engineering Evaluation Template, www.baaqmd.gov/pmt/handbook/s11c02ev.htm: Bulk aggregate moisture content typically stabilizes between 3 and 5% by weight.

Windspeed Variation Factors for AERMOD modeling:				PM10		PM2.5	
Wind Category	Upper windspeed (m/sec)	Avg windspeed (m/sec)	Avg windspeed (mph)	E @ avg mph	F = Eavg mph/ E@10mph	E @ avg mph	F = Eavg mph/ E@10mph
Cat 1:	1.54	0.77	1.72	1.59E-04	0.1016	2.41E-05	0.1016
Cat 2:	3.09	2.32	5.18	6.65E-04	0.4251	1.01E-04	0.4251
Cat 3:	5.14	4.12	9.20	1.40E-03	0.8979	2.13E-04	0.8979
Cat 4:	8.23	6.69	14.95	2.64E-03	1.687	3.99E-04	1.687
Cat 5:	10.80	9.52	21.28	4.17E-03	2.670	6.32E-04	2.670
Cat 6:	14.00	12.40	27.74	5.89E-03	3.767	8.92E-04	3.767

Aggregate Front End Loader Drop Points

Drop to storage pile and drop to bins: **336 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.11	0.46	0.24	0.05	2.22	0.93	0.48	0.11
PM-10 (total)	1.56E-03	0.53	0.22	0.11	0.03	1.05	0.44	0.23	0.05
PM-2.5	2.37E-04	0.08	0.03	0.02	0.00	0.16	0.07	0.03	0.01

Conveyor and Scalping Screen Emission Points

Moisture/Control %:
AP-42 Table 11.19.2-2, Note b. Moisture content of uncontrolled sources ranged from 0.21 to 1.3%
AP-42 Table 11.19.2-2, Note b. Moisture content of controlled (water spray) sources ranged from 0.55 to 2.88% --> ~91.3% control for screening, ~95% control for conveyor transfer
Bulk aggregate for HMA plants typically stabilizes between 3 and 5% by weight--> Apply additional **90%** control to lb/hr, etc. for the higher moisture.

Aggregate Weigh Conveyor

Transfer from bins to conveyor and from conveyor to scalping screen: **336 T/hr** **2** Transfer Points

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point				Total Emissions			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.11E-01	4.63E-02	2.38E-02	5.43E-03	2.22E-01	9.25E-02	4.76E-02	1.09E-02
PM-10 (total)	1.56E-03	5.25E-02	2.19E-02	1.13E-02	2.57E-03	1.05E-01	4.38E-02	2.25E-02	5.14E-03
PM-2.5	2.37E-04	7.95E-03	3.31E-03	1.70E-03	3.89E-04	1.59E-02	6.63E-03	3.41E-03	7.78E-04

Aggregate Scalping Screen, AP-42 11.19 (8/04)

Aggregate flow across scalping screen onto conveyor: **336 T/hr**

Pollutant	Emission Factor Table 11.19.2-2 SCREENING UNCONTROLLED (lb/ton)	Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	0.025	0.840	3.50E-01	1.80E-01	4.11E-02
PM-10 (total)	0.0087	0.292	1.22E-01	6.26E-02	1.43E-02
PM-2.5	1.30E-04	0.004	1.82E-03	9.36E-04	2.14E-04

Aggregate Conveyor to Drum (~top end of the drum)

Aggregate transfer from conveyor to drum dryer (1 transfer point): **336 T/hr**

Pollutant	Calculated Emission Factor from AP-42 13.2.4 (lb/ton)	Emissions Per Transfer Point			
		Emissions (lb/hr) 1-hr Average	Emissions (lb/hr) 24-hr Average	Emissions (T/yr)	Emissions (lb/hr) Annual Average
PM (total)	3.31E-03	1.11E-01	4.63E-02	2.38E-02	5.43E-03
PM-10 (total)	1.56E-03	5.25E-02	2.19E-02	1.13E-02	2.57E-03
PM-2.5	2.37E-04	7.95E-03	3.31E-03	1.70E-03	3.89E-04

Facility: CD'A Redi Mix
3/22/2019 7:41 **Permit/Facility ID:** P-2016.0006 055-00125

Asphalt Tank Heater - #2 Oil Fired, Estimated GHG Emissions Using AP-42 Sections 11.1 (HMA Plants) & 1.3 (Fuel Oil Combustion)

Hot Mix Plant Fuel Type Toggle (#2) =	0
Hot Mix Plant Fuel Type Toggle (Used Oil) =	0
Hot Mix Plant Fuel Type Toggle (NG) =	1
Hot Mix Plant Fuel Type Toggle (LPG) =	0
Tank Heater Fuel Type Toggle (NG) =	0
Tank Heater Fuel Type Toggle (#2) =	1

Note: CO2e emissions from the silo, loadout operation, and the tanks were assumed to be negligible (less than 1 ton per year).

Green House Gas Emissions When Combusting #2 Fuel Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	0.00	1.00	0.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.00	21.00	0.00
N_2O	0.26	$lb/10^3$ gal	AP-42 Table 1.3-8	0.000000	310.00	0.00

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	Assumes all carbon is converted to CO_2			693.57	1	693.57
Methane	0.216	$lb/10^3$ gal	AP-42 Table 1.3-3	5.67E-03	21	0.12
N_2O	0.26	$lb/10^3$ gal	AP-42 Table 1.3-8	2.93E+00	310	907.50

Green House Gas Emissions When Combusting Used Oil

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	0.00	1.00	0.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.00	21.00	0.00
N_2O	0.53	$lb/10^3$ gal	AP-42 Table 1.3-8	0.000000	310.00	0.00

Green House Gas Emissions When Combusting Natural Gas

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	2,475.00	1.00	2,475.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.90	21.00	18.90
N_2O	0.26	$lb/10^3$ gal	AP-42 Table 1.3-8	0.043911	310.00	13.61

Tank Heater	Emission Factor (EF)	EF Units	EF Source	T/yr	Global Warming Potential	CO_2e T/yr
CO_2	0.12	lb/scf	AP-42 Table 1.4-2	0.00	1	0.00
Methane	0.0000023	lb/scf	AP-42 Table 1.4-2	0.00E+00	21	0.00
N_2O	0.0000022	lb/scf	AP-42 Table 1.4-2	0.00E+00	310	0.00

Green House Gas Emissions When Combusting LPG

Asphalt Plant Emissions	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	33.00	lb/T	AP-42 Table 11.1-7	0.00	1.00	0.00
Methane	0.012	lb/T	AP-42 Table 11.1-8	0.00	21.00	0.00
N_2O	0.26	$lb/10^3$ gal	AP-42 Table 1.3-8	0.000000	310.00	0.00

Green House Gas Emissions When Combusting Diesel Fuel

IC Engine 1 < 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1.00	0.00

IC Engine 2 > 600 bhp	Emission Factor (EF)	EF Units	EF Source	Emissions (T/yr)	Global Warming Potential	CO_2e (T/yr)
CO_2	1.16	lb/bhp-hr	AP-42 Table 3.4-1	0.00	1.00	0.00

Total Green House Gas Emissions

Total Emissions	CO_2e (T/yr)
CO_2	3,168.57
Methane	19.02
N_2O	921.11
Grand Total	**4,108.70**

Facility: CD'A Redi Mix
3/22/2019 7:41 Permit/Facility ID: P-2016.0006 055-00125

EMISSION INVENTORY
POUNDS PER HOUR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 420 Hours/year 150,000 Tons/year 3,900 lbs/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected =
B. Tank Heater: 1.8000 MMBtu/hr 4,000 Hours/year 8 lbs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = Natural Gas
C1. IC Engine 1: 0.00 gal/hour 3000 Hours/year IC Engine < 600hp #2 Fuel Oil 24 lbs/day
C2. IC Engine 2: 0.00 gal/hour 0 Hours/year IC Engine > 600hp #2 Fuel Oil 0 lbs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine 1 + IC Engine 2 Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
PM (total)	11.05	1.34E-02	0.00E+00	3.99E-01	11.05
PM-10 (total)	8.06	1.34E-02	0.00E+00	3.99E-01	8.46
PM 2.5	7.81	1.34E-02	0.00E+00	3.99E-01	8.21
CO	45.50	1.40E-01	0.00E+00	8.85E-01	46.53
NOx	9.10	1.76E-01	0.00E+00		9.28
SO2	1.10	1.04E-03	0.00E+00		1.10
VOC	11.05	8.71E-03	0.00E+00	1.41E+00	12.00
Lead	2.17E-04	8.62E-07	0.00E+00		2.18E-04
HCl	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Dioxins*					
2,3,7,8-TCDD	0.00E+00				0.00E+00
Total TCDD	0.00E+00				0.00E+00
1,2,3,7,8-PeCDD	0.00E+00				0.00E+00
Total PeCDD	0.00E+00				0.00E+00
1,2,3,4,7,8-HxCDD	0.00E+00	0.00E+00			0.00E+00
1,2,3,6,7,8-HxCDD	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDD	0.00E+00	0.00E+00			0.00E+00
Total HxCDD	0.00E+00				0.00E+00
1,2,3,4,6,7,8-HpCDD	0.00E+00	0.00E+00			0.00E+00
Total HpCDD	0.00E+00	0.00E+00			0.00E+00
Octa CDD	0.00E+00	0.00E+00			0.00E+00
Total PCDD*	0.00E+00	0.00E+00			0.00E+00
Furans*					
2,3,7,8-TCDF	0.00E+00				0.00E+00
Total TCDF	0.00E+00	0.00E+00			0.00E+00
1,2,3,7,8-PeCDF	0.00E+00				0.00E+00
2,3,4,7,8-PeCDF	0.00E+00				0.00E+00
Total PeCDF	0.00E+00	0.00E+00			0.00E+00
1,2,3,4,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,6,7,8-HxCDF	0.00E+00				0.00E+00
2,3,4,6,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDF	0.00E+00				0.00E+00
Total HxCDF	0.00E+00	0.00E+00			0.00E+00
1,2,3,4,6,7,8-HpCDF	0.00E+00	0.00E+00			0.00E+00
1,2,3,4,7,8,9-HpCDF	0.00E+00	0.00E+00			0.00E+00
Total HpCDF	0.00E+00	0.00E+00			0.00E+00
Octa CDF	0.00E+00	0.00E+00			0.00E+00
Total PCDF*	0.00E+00	0.00E+00			0.00E+00
Total PCDD+PCDF*	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Non-PAH HAPs					
Acetaldehyde	0.00E+00		0.00E+00		0.00E+00
Acrolein*	0.00E+00		0.00E+00		0.00E+00
Benzene*	6.64E-03	1.93E-06	0.00E+00	1.04E-04	6.75E-03
1,3-Butadiene*			0.00E+00		0.00E+00
Chromium*	3.93E-03			2.37E-03	3.71E-02
Formaldehyde*	8.31E-02	0.04E-00	0.00E+00	1.30E-03	8.96E-02
Hexane*	1.34E-01	1.00E-03		2.89E-01	1.38E-01
Isooctane	3.83E-03			1.64E-05	3.85E-03
Methyl Ethyl Ketone*	0.00E+00			9.90E-04	9.90E-04
Propene*		1.53E-02			1.53E-02
Propionaldehyde*	0.00E+00				0.00E+00
Quinone*	0.00E+00				0.00E+00
Methyl chloride*	7.00E-03				7.00E-03
Toluene*	2.19E-02	2.00E-06	0.00E+00	2.19E-03	2.41E-02
Xylene*	3.90E-03		0.00E+00	1.19E-02	4.11E-02
POM (7-PAH Group)*	9.38E-04	8.19E-09	0.00E+00	1.04E-05	9.88E-04
TOTAL PAH HAPs	3.21E-03	1.52E-08	0.00E+00	8.42E-04	4.95E-03

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
PAH HAPs					
2-Methylnaphthalene	1.27E-03	1.93E-08		3.99E-04	1.64E-03
3-Methylchloranthrene*	0.00E+00	1.40E-09			1.40E-09
Acenaphthene	2.40E-06	1.40E-09	0.00E+00	3.59E-06	5.99E-06
Acenaphthylene	1.47E-04	1.40E-09	0.00E+00	3.24E-06	1.50E-04
Anthracene	2.77E-06	1.00E-09	0.00E+00	9.74E-06	1.28E-05
Benzo(a)anthracene	5.60E-06	1.40E-09	0.00E+00	3.06E-06	7.19E-06
Benzo(a)pyrene*	1.69E-07	9.47E-10	0.00E+00	1.34E-07	3.03E-07
Benzo(b)fluoranthene*	1.71E-06	1.40E-09	0.00E+00	4.44E-07	2.16E-06
Benzo(e)pyrene	1.88E-06	0.00E+00		5.58E-07	2.73E-06
Benzo(g,h,i)perylene	6.85E-07	0.67E-10	0.00E+00	1.11E-07	7.97E-07
Benzo(k)fluoranthene*	7.03E-07	1.40E-09	0.00E+00	1.25E-07	8.32E-07
Chrysene*	2.09E-06	1.40E-09	0.00E+00	1.51E-06	1.46E-06
Dibenz(a,h)anthracene*	0.00E+00	9.47E-10	0.00E+00	2.19E-06	2.20E-06
Dichlorobenzene	0.00E+00	8.03E-07			8.47E-07
Fluoranthene	1.94E-06	2.42E-09	0.00E+00	9.44E-06	1.99E-05
Fluorene	6.51E-06	2.39E-09	0.00E+00	8.89E-06	1.54E-04
Indeno(1,2,3-cd)pyrene*	1.20E-07	1.40E-09	0.00E+00	2.74E-08	1.49E-07
Naphthalene*	1.74E-03	4.90E-07	0.00E+00	1.53E-04	1.89E-03
Perylene	1.51E-07	0.00E+00		2.76E-08	3.74E-08
Phenanthrene	1.30E-04	1.27E-08	0.00E+00	1.28E-04	2.58E-04
Pyrene	3.31E-06	1.60E-09	0.00E+00	3.79E-06	3.71E-05
Non-HAP Organic Compounds					
Acetone*	0.00E+00	0.00E+00		1.20E-03	1.20E-03
Benzaldehyde	0.00E+00	0.00E+00			0.00E+00
Butane	8.71E-02	1.34E-02			8.84E-02
Butyraldehyde	0.00E+00	0.00E+00			0.00E+00
Propionaldehyde*	0.00E+00	0.00E+00			0.00E+00
Styrene	1.37E-05	0.00E+00		2.39E-05	1.37E-05
Hexanal	0.00E+00	0.00E+00			0.00E+00
Isovaleraldehyde	0.00E+00	0.00E+00			0.00E+00
2-Methyl-1-pentene	5.53E-01	0.00E+00			5.53E-01
2-Methyl-2-butene	6.46E-02	0.00E+00			6.46E-02
3-Methylpentane	2.71E-02	0.00E+00			2.71E-02
1-Pentene	2.21E-01	0.00E+00			3.21E-01
n-Pentane	3.08E-02	0.00E+00			3.00E-02
Vinylcyclohexene	0.00E+00	0.00E+00			0.00E+00
Metals					
Antimony*	2.51E-05	0.00E+00			2.63E-05
Arsenic*	3.39E-06	1.61E-07			3.73E-06
Barium*	4.46E-04	2.98E-08			4.49E-04
Beryllium*	0.00E+00	9.67E-09			9.97E-09
Cadmium*	7.02E-06	8.68E-07			7.81E-06
Chromium*	9.03E-04	9.34E-07			9.03E-04
Cobalt*	3.79E-06	4.94E-08			3.84E-06
Copper*	4.52E-04	0.00E+07			4.53E-04
Hexavalent Chromium*	7.71E-06	0.00E+00			7.71E-06
Manganese*	1.53E-03	0.00E+00			1.53E-03
Mercury*	3.50E-06	0.00E+00			3.50E-06
Molybdenum*	0.00E+00	6.47E-07			6.47E-07
Nickel*	1.08E-03	0.00E+00			1.08E-03
Phosphorus*	4.09E-03	0.00E+00			4.09E-03
Silver*	7.00E-06	0.00E+00			7.00E-06
Selenium*	5.10E-05	0.00E+00			5.10E-05
Thallium*	5.39E-07	0.02E+00			5.39E-07
Vanadium*	0.00E+00	1.35E-06			1.35E-06
Zinc*	8.90E-03	0.00E+00			8.90E-03

e) ICAPA Toxic Air Pollutant

Criteria Pollutant lb/hr emissions are maximum 1-hr averages
TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

Facility: CD'A Redi Mix
3/22/2019 7:41 Permit/Facility ID: P-2016.0006 055-00125

EMISSION INVENTORY
POUNDS PER HOUR

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 300 Tons/hour 420 Hours/year 150,000 Tons/year HMA throughput 3,900 lbs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = Natural Gas
B. Tank Heater: 1.8000 MMBtu/hr 4,000 Hours/year 8 lbs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = Natural Gas
C1. IC Engine 1: 0.00 gal/hour 3000 Hours/year #2 Fuel Oil Generator < 600hp 24 lbs/day
C2. IC Engine 2: 0.00 gal/hour 0 Hours/year #2 Fuel Oil Generator > 600hp 0 lbs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C IC Engine Max Emission Rate for Pollutant (lb/hr)	D Load-out & Silo Filling Emission Rate for Pollutant (lb/hr)	E TOTAL of Max Emission Rates from A, B, C & D (lb/hr)
non-PAH HAPs					
Bromomethane*				1.40E-04	1.40E-04
2-Butanone (aka Methyl Ethyl Ketone)					1.40E-09
Carbon disulfide*				3.63E-04	3.63E-04
Chloroethane (Ethyl chloride*)				7.24E-05	7.24E-05
Chloromethane (Methyl chloride*)				5.00E-04	5.00E-04
Cumene				6.67E-04	6.67E-04
n-Hexane					
Methylene chloride (Dichloromethane*)				4.60E-08	4.60E-08
MTBE					
Styrene*				1.40E-04	1.40E-04
Tetrachloroethene (Tetrachloroethylene*)				4.67E-05	4.67E-05
1,1,1-Trichloroethane (Methyl chloroform*)					
Trichloroethene (Trichloroethylene*)					
Trichlorofluoromethane				7.59E-05	7.59E-05
m-/p-Xylene*				6.04E-03	6.04E-03
o-Xylene*				3.67E-03	3.67E-03
Phenol*				5.67E-04	5.67E-04
Non-HAP Organic Compounds					
Methane				0.02E-01	0.02E-01

e) ICAPA Toxic Air Pollutant

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Facility: CD'A Redi Mix
3/22/2019 7:41 Permit/Facility ID: P-2016.0006 055-00125

EMISSION INVENTORY
TONS PER YEAR
Page 1 of 2

Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 200 Tons/hour 420 Hours/year 130,000 Tons/year 3,000 tons/day
Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected = Natural Gas

B. Tank Heater: 1.8000 MMBtu/hr 4,000 Hours/year 8 hrs/day
Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected = Natural Gas

C1. IC Engine 1: 0.00 gal/hour 3000 Hours/year IC Engine <600hp #2 Fuel Oil 24 hrs/day
C2. IC Engine 2: 0.00 gal/hour 0 Hours/year IC Engine > 600hp #2 Fuel Oil 0 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (Tlyr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (Tlyr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (Tlyr)	D Load-out & Silo Filling Emission Rate for Pollutant (Tlyr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (Tlyr) Exclude (Fug)fines (D)
PM (total)	2.40	2.09E-02	0.00E+00	8.31E-02	2.50
PM-10 (total)	1.73	2.09E-02	0.00E+00	8.31E-02	1.83
PM-2.5	1.67	2.09E-02	0.00E+00	8.31E-02	1.75
CO	8.75	2.36E-01	0.00E+00	1.90E-01	10.00
NOx	1.96	3.03E-01	0.00E+00		2.30
SO2	0.26	2.13E-02	0.00E+00		0.28
VOC	0.80	1.94E-02	0.00E+00	3.02E-01	2.41
Lead	4.65E-05	1.76E-06	0.00E+00		4.83E-05
HCl *	0.00E+00	0.00E+00	0.00E+00		0.00E+00
Dioxins*					
2,3,7,8-TCDD	0.00E+00				0.00E+00
Total TCDD	0.00E+00				0.00E+00
1,2,3,7,8-PeCDD	0.00E+00				0.00E+00
Total PeCDD	0.00E+00				0.00E+00
1,2,3,4,7,8-HxCDD	0.00E+00	0.00E+00			0.00E+00
1,2,3,6,7,8-HxCDD	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDD	0.00E+00	0.00E+00			0.00E+00
Total HxCDD	0.00E+00				0.00E+00
1,2,3,4,6,7,8-HpCDD	0.00E+00	0.00E+00			0.00E+00
Total HpCDD	0.00E+00	0.00E+00			0.00E+00
Octa CDD	0.00E+00	0.00E+00			0.00E+00
Total PCDD*	0.00E+00	0.00E+00			0.00E+00
Furans*					
2,3,7,8-TCDF	0.00E+00				0.00E+00
Total TCDF	0.00E+00	0.00E+00			0.00E+00
1,2,3,7,8-PeCDF	0.00E+00				0.00E+00
2,3,4,7,8-PeCDF	0.00E+00				0.00E+00
Total PeCDF	0.00E+00	0.00E+00			0.00E+00
1,2,3,4,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,6,7,8-HxCDF	0.00E+00				0.00E+00
2,3,4,6,7,8-HxCDF	0.00E+00				0.00E+00
1,2,3,7,8,9-HxCDF	0.00E+00				0.00E+00
Total HxCDF	0.00E+00	0.00E+00			0.00E+00
1,2,3,4,6,7,8-HpCDF	0.00E+00				0.00E+00
1,2,3,4,7,8,9-HpCDF	0.00E+00				0.00E+00
Total HpCDF	0.00E+00	0.00E+00			0.00E+00
Octa CDF	0.00E+00	0.00E+00			0.00E+00
Total PCDF*	0.00E+00	0.00E+00			0.00E+00
Total PCDD/PCDF*	0.00E+00	0.00E+00			0.00E+00
Non PAH HAPs					
Acetaldehyde	6.03E+00		0.00E+00		0.00E+00
Acrolein*	0.00E+00		0.00E+00		0.00E+00
Benzene*	2.93E-02	7.41E-06	0.00E+00	4.03E-04	2.93E-02
1,3-Butadiene*	0.00E+00		0.00E+00		0.00E+00
Ethylbenzene*	1.80E-02			1.22E-02	1.92E-02
Formaldehyde*	2.33E-01	2.80E-04	0.00E+00	4.54E-03	2.38E-01
Hexane*	6.85E-02	6.26E-03		1.39E-02	7.04E-02
Isooctane	3.09E-03			5.45E-04	3.63E-03
Methyl Ethyl Ketone*	0.00E+00			5.03E-04	0.00E+00
Perlene*	0.00E+00	9.18E-03			9.18E-03
Propionaldehyde*	0.00E+00				0.00E+00
Quinone*	0.00E+00				0.00E+00
Methyl chloride*	3.93E-03				3.93E-03
Toluene*	1.13E-02	1.23E-05	0.00E+00	1.22E-03	1.13E-02
Xylene*	1.50E-02	8.00E-06	0.00E+00	6.12E-03	1.50E-02
TOTAL Federal HAPs (Tlyr)					4.25E-01

Pollutant	A Drum Mix Max Emission Rate for Pollutant (Tlyr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (Tlyr)	C IC Engine IC1 + IC2 Max Emission Rate for Pollutant (Tlyr)	D Load-out & Silo Filling Emission Rate for Pollutant (Tlyr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (Tlyr) Exclude (Fug)fines (D)
PAH HAPs					
2-Methylnaphthalene	3.19E-03	8.47E-06		1.81E-02	3.10E-03
3-Methylchloranthrene*	0.00E+00	6.35E-09			6.35E-09
Acenaphthene	1.25E-04	8.30E-09	0.00E+00	1.10E-04	1.05E-04
Acenaphthylene	6.40E-05	8.35E-09	0.00E+00	9.83E-05	6.40E-05
Anthracene	1.63E-05	6.47E-09	0.00E+00	4.27E-05	1.63E-05
Benzo(a)anthracene	1.58E-05	6.30E-09	0.00E+00	1.03E-05	1.58E-05
Benzo(b)pyrene*	7.30E-07	4.24E-09	0.00E+00	5.84E-07	7.30E-07
Benzo(b,j)fluoranthene	7.50E-06	6.30E-09	0.00E+00	1.84E-06	7.51E-06
Benzo(g)chrysene	8.20E-05	6.00E+00		3.80E-06	8.20E-05
Benzo(g,h,i)perylene	3.00E-06	4.24E-09	0.00E+00	4.96E-07	3.00E-06
Benzo(k)fluoranthene	3.08E-06	6.30E-09	0.00E+00	6.63E-07	3.08E-06
Chrysene	1.30E-05	6.30E-09	0.00E+00	6.63E-07	1.30E-05
Dibenzo(a,h)anthracene	0.00E+00	4.24E-09	0.00E+00	9.93E-08	4.24E-09
Dibenzofuran/ene	0.00E+00	4.24E-09			4.24E-09
Fluoranthene	4.58E-05	1.06E-08	0.00E+00	4.13E-05	4.58E-05
Fluorene	2.50E-04	9.88E-09	0.00E+00	3.89E-04	2.50E-04
Indeno(1,2,3-cd)pyrene	8.20E-07	6.35E-09	0.00E+00	1.20E-07	8.31E-07
Naphthalene*	6.73E-03	2.12E-05	0.00E+00	6.99E-04	6.77E-03
Perylene	6.90E-07	0.00E+00		1.13E-06	6.90E-07
Phenanthrene	6.73E-04	9.53E-08	0.00E+00	9.93E-04	8.23E-04
Pyrene	4.60E-05	1.76E-08	0.00E+00	1.22E-04	4.60E-05
Non-HAP Organic Compounds					
Acetone*	0.00E+00	0.00E+00		6.49E-04	0.00E+00
Benzaldehyde	0.00E+00	0.00E+00			0.00E+00
Butane	0.00E+00	7.41E-03			5.72E-03
Butanal/butyle	0.00E+00	0.00E+00			0.00E+00
Crotonaldehyde*	0.00E+00	0.00E+00			0.00E+00
Ethylene	9.25E-01	0.00E+00		1.23E-02	9.25E-01
Hexane	7.05E-01	0.00E+00			7.05E-01
Isobutane	0.00E+00	0.00E+00			0.00E+00
Isovaleraldehyde	0.00E+00	0.00E+00			0.00E+00
2-Methylpentane	3.00E-01	0.00E+00			3.00E-01
3-Methylhexane	4.30E-02	0.00E+00			4.30E-02
3-Methylpentane	1.43E-02	0.00E+00			1.43E-02
n-Pentane	1.93E-01	0.00E+00			1.93E-01
n-Pentanal	1.04E-02	0.00E+00			1.04E-02
Valeraldehyde*	0.00E+00	0.00E+00			0.00E+00
Metals					
Antimony*	1.20E-05	0.00E+00			1.20E-05
Arsenic*	4.20E-05	7.06E-07			4.27E-05
Barium*	4.39E-04	1.50E-05			4.54E-04
Beryllium*	0.00E+00	4.24E-08			4.24E-08
Cadmium*	3.68E-05	3.68E-06			3.48E-05
Chromium*	4.13E-04	4.94E-06			4.17E-04
Cobalt*	1.90E-04	2.96E-07			2.25E-04
Copper*	2.33E-04	3.00E-06			2.36E-04
Hexavalent Chromium*	3.39E-05	0.00E+00			3.39E-05
Manganese*	5.71E-04	0.00E+00			5.71E-04
Mercury*	1.60E-05	0.00E+00			1.60E-05
Molybdenum*	0.00E+00	3.56E-06			3.56E-06
Nickel*	4.73E-05	0.00E+00			4.73E-05
Phosphorus*	2.10E-03	0.00E+00			2.10E-03
Silver*	2.60E-06	0.00E+00			3.00E-06
Selenium*	2.60E-06	0.00E+00			2.60E-06
Thallium*	3.09E-01				3.09E-01
Vanadium*	0.00E+00	5.12E-06			5.12E-06
Zinc*	4.56E-03	0.00E+00			4.56E-03

Facility: CD'A Redi Mix
3/22/2019 7:41 Permit/Facility ID: P-2016.0006 055-00125

EMISSION INVENTORY
TONS PER YEAR
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Max Controlled Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 200 Tons/hour 420 Hours/year 130,000 Tons/year 3,000 Tons/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = Natural Gas

B. Tank Heater: 1.8000 MMBtu/hr 4,000 Hours/year 8 hrs/day
Maximum emission for each pollutant from any fuel-burning option selected. Fuels Selected = Natural Gas

C1. Generator G1: 0.00 gal/hour 3000 Hours/year #2 Fuel Oil IC Engine <600hp 24 hrs/day
C2. Generator G2: 0.00 gal/hour 0 Hours/year #2 Fuel Oil IC Engine > 600hp 0 hrs/day

Pollutant	A Drum Mix Max Emission Rate for Pollutant (Tlyr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (Tlyr)	C Generator Max Emission Rate for Pollutant (Tlyr)	D Load-out, Silo Filling, & Tank Storage Emission Rate for Pollutant (Tlyr)	E POINT SOURCE TOTAL of Max Emission Rates from A, B, & C (Tlyr) Exclude Fug)fines (D)
non-PAH HAPs					
Bromomethane*				7.47E-06	0.00E+00
2-Butanone (see Methyl Ethyl Ketone)					0.00E+00
Carbon disulfide*				1.67E-04	0.00E+00
Chloroethane (Ethyl chloride*)				3.73E-05	0.00E+00
Chloromethane (Methyl chloride*)				2.57E-04	0.00E+00
Cumene				3.43E-04	0.00E+00
n-Hexane				0.00E+00	0.00E+00
Methylene chloride (Dichloromethane*)				2.47E-06	0.00E+00
MTBE					0.00E+00
Styrene*				7.21E-06	0.00E+00
Tetrachloroethene (Tetrachloroethylene*)				2.42E-05	0.00E+00
1,1,1-Trichloroethane (Methyl chloroform*)				0.00E+00	0.00E+00
Trichloroethene (Trichloroethylene*)				0.00E+00	0.00E+00
Trichlorofluoromethane				4.00E-06	0.00E+00
m-&-p-Xylene*				3.11E-03	0.00E+00
o-Xylene*				3.02E-03	0.00E+00
Phenol*				3.02E-04	0.00E+00
Non-HAP Organic Compounds					
Methane				2.50E-01	0.00E+00

* = IDAPA Toxic Air Pollutant

Facility: CD'A Redi Mix

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CRITERIA POLLUTANT MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

Maximum Controlled Emissions of Any Pollutant from Drum Mix HMA Plant with Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 350 Tons/hour 429 Hours/year 150,000 Tons/year 3,500 Tons/day 10. hr/day 429 hr/yr

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected =

	0.0015% S	0.5000% S	Natural Gas

B. Tank Heater: 1.8000 MMBtu Rate 4,000 Hours/year 8 hrs/day

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected =

0.5000% S		Natural Gas
0.0015% S	#2 Fuel Oil	

C1. IC Engine 1: 0.00 gal/hour 3000 Hours/year IC Engine < 600hp 24 hrs/day

0.0015% S	#2 Fuel Oil

C2. IC Engine 2: 0.00 gal/hour 0 Hours/year IC Engine > 600hp 0 hrs/day

Max 1-hour, 3-hour, and 8-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 IC2 > 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	8.05	1.34E-02	0.00E+00	0.00E+00	2.05E-01	1.83E-01	
PM-2.5	7.81	1.34E-02	0.00E+00	0.00E+00	2.05E-01	1.83E-01	
CO	45.50	1.48E-01	0.00E+00	0.00E+00	4.13E-01	4.72E-01	
NOx	9.10	1.76E-01	0.00E+00	0.00E+00			
SO_2	1.19	1.06E-03	0.00E+00	0.00E+00			
VOC	11.20	9.71E-03	0.00E+00	0.00E+00	4.27E-02	1.37E+00	
Lead	2.17E-04	8.82E-07					

Max 24-hour averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1 < 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	3.35	4.47E-03	0.00E+00	0.00E+00	8.54E-02	7.61E-02	
PM-2.5	3.25	4.47E-03	0.00E+00	0	8.54E-02	7.61E-02	
CO							
NOx							
SO_2	0.50	3.53E-04	0.00E+00	0.00E+00			
VOC							
Lead							

Max Annual averages

Pollutant	A Drum Mix Max Emission Rate for Pollutant (lb/hr)	B Asphalt Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 G1< 600 hp Generator Max Emission Rate for Pollutant (lb/hr)	C2 G2 > 600hp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)	See Scalping Scrn & Transfer Points" worksheet for 1-hour, 24-hour, and annual PM10 emission rates from those sources.
PM (total)							
PM-10 (total)	0.39	6.12E-03	0.00E+00	0.00E+00	1.00E-02	8.94E-03	
PM-2.5	0.38	6.12E-03					
CO							
NOx	0.45	8.06E-02	0.00	0.00			
SO_2	0.06	0.00	0.00E+00	0.00			
VOC							
Lead							

Facility: CDA Redi Mix
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TAPs EL Screen - ALL SOURCES
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Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included

A. Drum Mix Plant: 350 Tons/hour 429 Hours/year 150,000 Tons/yr 3,500 Tons/dy
Maximum emission for each pollutant from any fuel-burning option selected in "Facility Data" worksheet.

B. Tank Heater: 1.8000 MMBtu/Rated 4,000 Hours/year D. Include all emissions from Load-out/Silo Filling? Yes
Maximum emission for each pollutant for heater burning any fuel selected in "Facility Data" worksheet.

C1. IC Engine G1: 0.00 ea/hour 3000 Hours/year IC Engine <600hr #2 Fuel Oil 24 hrs/dy
C2. IC Engine G2: 0.00 ea/hour 0 Hours/year IC Engine > 600hr #2 Fuel Oil 0 hrs/dy

Pollutant	TOTAL of Max Emission Rates from A, B, & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[2] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled? Meets AAC or AACC?
HCl[4]	0.000	2.05	No	

Dioxins		Toxic Equivalency Factor[3]	Adjusted Emission Rate (lb/hr)	
2,3,7,8-TCDD	0.000E+00	1.0	0.000E+00	
Total TCDD	0.000E+00	n/a		
1,2,3,7,8-PeCDD	0.000E+00	1.0	0.000E+00	
Total PeCDD	0.000E+00	n/a		
1,2,3,4,7,8-HxCDD	0.000E+00	0.1	0.000E+00	
1,2,3,6,7,8-HxCDD	0.000E+00	0.1	0.000E+00	
1,2,3,7,8,9-HxCDD	0.000E+00	0.1	0.000E+00	
Total HxCDD	0.000E+00	n/a		
1,2,3,4,6,7,8-HpCDD	0.000E+00	0.01	0.000E+00	
Total HpCDD	0.000E+00	n/a		
Octa CDD	0.000E+00	0.0003	0.000E+00	
Total PCDD	0.000E+00	n/a		
Furans				
2,3,7,8-TCDF	0.00E+00	0.1	0.00E+00	
Total TCDF	0.00E+00	n/a		
1,2,3,7,8-PeCDF	0.00E+00	0.03	0.00E+00	
2,3,4,7,8-PeCDF	0.00E+00	0.3	0.00E+00	
Total PeCDF	0.00E+00	n/a		
1,2,3,4,7,8-HxCDF	0.00E+00	0.1	0.00E+00	
1,2,3,6,7,8-HxCDF	0.00E+00	0.1	0.00E+00	
1,2,3,7,8,9-HxCDF	0.00E+00	0.1	0.00E+00	
2,3,4,6,7,8-HxCDF	0.00E+00	0.1	0.00E+00	
Total HxCDF	0.00E+00	n/a		
1,2,3,4,6,7,8-HpCDF	0.00E+00	0.01	0.00E+00	
1,2,3,4,7,8,9-HpCDF	0.00E+00	0.01	0.00E+00	
Total HpCDF	0.00E+00	n/a		
Octa CDF	0.00E+00	0.0003	0.00E+00	
Total PCDF	0.00E+00	n/a		
Total PCDD/PCDF	0.00E+00	n/a		

TOTAL Dioxin/Furans[5]	Adjusted lb/hr 0.00E+00	TAPs EL for 2,3,7,8 TCDD 1.29E-10	Exceeds TAPs EL? No	Modeled?

Non-PAH HAPs				
Acetaldehyde	0.00E+00	3.00E-02	No	
Acrolein	0.00E+00	0.017	No	
Benzene	8.78E-03	8.80E-04	Exceeds	
1,3-Butadiene				
Chloroform	3.74E-02	29	No	
Formaldehyde	5.46E-02	5.10E-04	Exceeds	
Hexane	1.36E-01	12	No	
Isophorone	5.82E-03			
Methyl Ethyl Ketone	8.36E-04	39.3	No	
Perylene	1.51E-03	1.19	No	
Propionaldehyde	0.00E+00	0.0197	No	
Quinone	0.00E+00	0.027	No	
Methyl Hydrazine	7.80E-03	1.27	No	
Toluene	2.43E-02	95	No	
Xylene	4.11E-02	29	No	

Pollutant	TOTAL of Max Emission Rates from A, B, & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[2] (lb/hr)	TAPs Emissions Exceed EL Increment	Modeled? Meets AAC or AACC?
PAH HAPs				
2-Methylnaphthalene	1.54E-03	8.10E-06	Exceeds	
3-Methylchloranthrene	1.49E-09	2.90E-09	No	
Acenaphthene	5.36E-05	8.10E-06	Yes	
Acenaphthylene	1.50E-04	8.10E-06	Exceeds	
Anthracene	1.35E-05	8.10E-06	Yes	
Benz(a)anthracene	7.14E-06			see POM
Benzo(a)pyrene	3.03E-07	2.00E-09	Yes	see POM
Benzo(b)fluoranthene	2.10E-06			see POM
Benzo(e)pyrene	2.75E-06	8.10E-06	No	
Benzo(g,h,i)perylene	2.91E-07	8.10E-06	Yes	
Benzo(k)fluoranthene	4.32E-07			see POM
Chrysene	1.83E-06			see POM
Dibenz(a,h)anthracene	3.28E-06			see POM
Dibenzofuran	3.67E-07	8.10E-06	Yes	
Fluoranthene	1.90E-05	8.10E-06	Yes	
Fluorene	1.54E-04	8.10E-06	Exceeds	
Indeno(1,2,3-cd)pyrene	1.49E-07			see POM
Naphthalene[6]	1.89E-03	8.70E-05	Exceeds	
Perylene	2.74E-06	8.10E-06	Yes	
Phenanthrene	2.29E-04	8.10E-06	Exceeds	
Pyrene	3.71E-05	8.10E-06	Yes	
Polycyclic Organic Matter[7]	2.84E-05	2.00E-06	Exceeds	
Non-HAP Organic Compounds				
Acetone	1.28E-03	119	Yes	
Benzaldehyde	0.00E+00			
Ethane	1.84E-05			
Ethylbenzene	0.00E+00			
Octylaldehyde	0.00E+00	0.34	No	
Propane	1.97E-06	109	No	
Pentanal	0.00E+00			
Tetradecanal/Hexyl	0.00E+00			
2-Methyl-1-pentene	1.83E-01			
2-Methyl-2-butene	4.47E-02			
3-Methylpentane	2.77E-02			
1-Pentene	3.21E-01			
n-Pentane[8]	3.59E-02	118	No	
Valeraldehyde (n-Valeraldehyde)	0.00E+00	11.7	No	
Metals				
Antimony[9]	2.53E-05	0.033	No	
Arsenic	3.75E-06	1.50E-06	Exceeds	
Barium	5.46E-04	0.033	No	
Beryllium	9.67E-07	2.80E-06	No	
Cadmium	7.81E-06	3.70E-06	Exceeds	
Chromium	8.00E-04	0.033	No	
Cobalt	3.84E-06	0.0033	No	
Copper	4.53E-04	0.013	No	
Hexavalent Chromium	7.73E-06	8.90E-07	Exceeds	
Manganese	1.12E-03	0.067	No	
Mercury	3.50E-06	0.003	No	
Molybdenum	8.47E-07	0.333	No	
Nickel	1.09E-03	2.70E-06	Exceeds	
Phosphorus	4.68E-03	0.067	No	
Silver	7.80E-06	0.007	No	
Selenium	3.15E-06	0.013	No	
Thallium	5.56E-07	0.007	No	
Vanadium	1.05E-06	0.003	No	
Zinc	3.90E-03	0.667	No	

a) Reserved.
b) Toxic Air Pollutants IDAPA 58.01.01.585 and 586 levels ineffect as of February 25, 2009
c) 2005 Van den Berg et al. Che 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds.
Toxicological Sciences 93(2), 223-241 (2006). Accessible at http://toxsci.oxfordjournals.org/cgi/reprint/93/2/223.
Use of the 2005 WHO toxic equivalency factors (TEFs) is consistent with current EPA recommendations for TRI reporting (72 FR 26544 May 10, 2007).
n/a = not available. IDAPA 58.01.01.586, TAPs Carcinogenic Increments. Total of adjusted emission rates are treated as a single PAH (2,3,7,8 TCDD).
d) IDAPA 58.01.01.586 Polycyclic Organic Matter Emissions (Highlighted PAHs h and be summed together as one TAP equivalent in potency to benzo(a)pyrene.
e) Naphthalene is Mainly a noncarcinogenic PAH in IDAPA 58.01.01.585 (EL = 3.33 lb/hr), but must also be considered as a carcinogenic PAH (EL = 8.10E-06 lb/hr).
TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.
Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

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TAPs EL Screen - ALL SOURCES
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Max Emissions of Any Pollutant from Drum Mix HMA Plant Fabric Filter, Tank Heater, Silo Fill/Load-out - Generator not included
A. Drum Mix Plant: 350 Tons/hour 429 Hours/year 150,000 Tons/yr 3,500 Tons/dy
Maximum emission for each pollutant from any fuel-burning option selected in "Facility Data" worksheet.
B. Tank Heater: 1.8000 MMBtu/Rated 4,000 Hours/year D. Include all emissions from Load-out/Silo Filling? Yes
Maximum emission for each pollutant for heater burning any fuel selected in "Facility Data" worksheet.
C1. IC Engine G1: 0.00 ea/hour 3000 Hours/year #2 Fuel Oil 24 hrs/dy
C2. IC Engine G2: 0.00 ea/hour 0 Hours/year #2 Fuel Oil 0 hrs/dy

Pollutant	TOTAL of Max Emission Rates from A, B & D (lb/hr)	TAPs Screening Emission Limit (EL) Increment[2] (lb/hr)	TAPs Emissions Exceed EL Increment?	Modeled?
non-PAH HAPs				
Bromomethane (Methyl bromide)	1.46E-04	1.27	No	
2-Butanone (aka Methyl Ethyl Ketone)				
Carbon disulfide[9]	3.92E-04	3	No	
Chloroethane (Ethyl chloride)	7.24E-05	179	No	
Chloromethane (Methyl chloride)	5.00E-04	0.667	No	
Cumene[9]	6.67E-04	16.3	No	
n-Hexane[9] (see Hexane)				
Methylene chloride (Dichloromethane)	4.80E-06	1.90E-03	No	
MTBE	0.00E+00			
Styrene[9]	3.49E-04	0.67	No	
Tetrachloroethene (Tetrachloroethylene)	4.07E-05	1.30E-03	No	
1,1,1-Trichloroethane (see Methyl chloroform)				
Trichloroethene (Trichloroethylene)	0.00E+00	17.93	No	
Trichlorofluoromethane	7.84E-05			
m-Xylene[9] (added to Xylene)				
o-Xylene[9] (added to Xylene)				
p-Xylene[9]	0.67E-04	1.27	No	

Non-HAP Organic Compounds	
Methane	3.02E-01

a) For HMA facilities subject to NSPS (40 CFR 60, Subpart I): PTE includes fugitive emissions of PM from load-out, silo filling & storage bank operations.
c) IDAPA Toxic Air Pollutant 58.01.01.585 or 586

Facility: CD'A Redi Mix

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TAPs MODELING

POUNDS PER HOUR - POINT AND PSEUDO-STACK SOURCES

Maximum Controlled Emissions of Any Pollutant from Drum Mix HMA Plant with Fabric Filter, Tank Heater, Generator, Silo Fill/Load-out

A. Drum Mix Plant: 350 Tons/hour 429 Hours/year 150,000 Tons/year 3,500 Tons/day Natural Gas

Maximum emission for each pollutant from any fuel-burning options selected on "Facility Data" worksheet. Fuels Selected =

B. Tank Heater: 1.8000 MMBtu Rated 4,000 Hours/year 8 hrs/day Natural Gas

Maximum emission for each pollutant for heater burning any fuel selected on "Facility Data" worksheet. Fuels Selected =

C1. IC Engine: 0.00 gal/hour 3000 Hours/year IC Engine < 600hp #2 Fuel Oil 24 hrs/day

C2. IC Engine: 0.00 gal/hour 0 Hours/year IC Engine > 600h #2 Fuel Oil 0 hrs/day

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	D1 Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)
PM (total)						
PM-10 (total)						
PM-2.5						
CO						
NOx						
SO_2						
VOC						
Lead						
HCl [g]	0.00E+00	0.00E+00	0	0		
Dioxins[e]						
2,3,7,8-TCDD	0.00E+00		0	0		
Total TCDD	0.00E+00		0	0		
1,2,3,7,8-PeCDD	0.00E+00		0	0		
Total PeCDD	0.00E+00		0	0		
1,2,3,4,7,8-HxCDD	0.00E+00	0.00E+00	0	0		
1,2,3,6,7,8-HxCDD	0.00E+00		0	0		
1,2,3,7,8,9-HxCDD	0.00E+00	0.00E+00	0	0		
Total HxCDD	0.00E+00		0	0		
1,2,3,4,6,7,8-Hp-CDD	0.00E+00	0.00E+00	0	0		
Total HpCDD	0.00E+00	0.00E+00	0	0		
Octa CDD	0.00E+00	0.00E+00	0	0		
Total PCDD[h]	0.00E+00	0.00E+00	0	0		
Furans[e]						
2,3,7,8-TCDF	0.00E+00		0	0		
Total TCDF	0.00E+00	0.00E+00	0	0		
1,2,3,7,8-PeCDF	0.00E+00		0	0		
2,3,4,7,8-PeCDF	0.00E+00		0	0		
Total PeCDF	0.00E+00	0.00E+00	0	0		
1,2,3,4,7,8-HxCDF	0.00E+00		0	0		
1,2,3,6,7,8-HxCDF	0.00E+00		0	0		
2,3,4,6,7,8-HxCDF	0.00E+00		0	0		
1,2,3,7,8,9-HxCDF	0.00E+00		0	0		
Total HxCDF	0.00E+00	0.00E+00	0	0		
1,2,3,4,6,7,8-HpCDF	0.00E+00		0	0		
1,2,3,4,7,8,9-HpCDF	0.00E+00		0	0		
Total HpCDF	0.00E+00	0.00E+00	0	0		
Octa CDF	0.00E+00	0.00E+00	0	0		
Total PCDF[h]	0.00E+00	0.00E+00	0	0		
Total PCDD/PCDF[h]	0.00E+00	0.00E+00	0	0		
Non-PAH HAPs						
Acetaldehyde[e]	0.00E+00		0	0		
Acrolein[e]	0.00E+00		0	0		
Benzene[e]	**6.68E-03**	**1.69E-06**	0	0	**6.68E-05**	**3.70E-05**
1,3-Butadiene[e]			0	0		
Ethylbenzene[e]	3.50E-02		0	0	6.75E-04	1.70E-03
Formaldehyde[e]	**5.31E-02**	**6.04E-05**	0	0	**1.44E-03**	**6.27E-05**
Hexane[e]	1.34E-01	1.06E-03	0	0	1.78E-03	9.10E-04
Isooctane	5.83E-03		0	0	5.51E-06	1.09E-05
Methyl Ethyl Ketone[e]	0.00E+00		0	0	6.93E-04	2.97E-04
Pentane[e]		1.53E-03	0	0		
Propionaldehyde[e]	0.00E+00		0	0		
Quinone[e]	0.00E+00		0	0		
Methyl chloroform[e]	7.00E-03		0	0		
Toluene[e]	2.19E-02	2.00E-06	0	0	1.10E-03	1.27E-03
Xylene[e]	2.92E-02		0	0	4.57E-03	7.34E-03
POM (7-PAH Group)	**9.38E-06**	**9.19E-09**		**0.00E+00**	**1.16E-05**	**7.88E-06**

Pollutant	A Drum Dryer Max Emission Rate for Pollutant (lb/hr)	B Asphaltic Oil Tank Heater Max Emission Rate for Pollutant (lb/hr)	C1 * see note IC1< 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	C2 * see note IC2 > 600 bhp Generator Max Emission Rate for Pollutant (lb/hr)	D Silo Filling Emission Rate for Pollutant (lb/hr)	D2 Load-out Emission Rate for Pollutant (lb/hr)
PAH HAPs						
2-Methylnaphthalene	1.27E-03	1.93E-08	0	0	2.29E-04	1.39E-04
3-Methylchloranthrene[e]	0.00E+00	1.45E-09	0	0		
Acenaphthene	2.40E-05	1.45E-09	0	0	2.04E-05	1.52E-05
Acenaphthylene	1.47E-04	1.45E-09	0	0	6.09E-07	1.63E-06
Anthracene	3.77E-06	1.93E-09	0	0	5.65E-06	4.09E-06
Benzo(a)anthracene[e]	3.60E-06	1.45E-09	0	0	2.43E-06	1.11E-06
Benzo(a)pyrene[e]	1.68E-07	9.67E-10	0	0	0.00E+00	1.34E-07
Benzo(b)fluoranthene[e]	1.71E-06	1.45E-09	0	0	0.00E+00	4.44E-07
Benzo(e)pyrene	1.88E-06	0.00E+00	0	0	4.13E-07	4.55E-07
Benzo(g,h,i)perylene	6.85E-07	9.67E-10	0	0	0.00E+00	1.11E-07
Benzo(k)fluoranthene[e]	7.02E-07	1.45E-09	0	0	0.00E+00	1.28E-07
Chrysene[e]	3.08E-06	1.45E-09	0	0	9.13E-06	6.01E-06
Dibenzo(a,h)anthracene[e]	0.00E+00	9.67E-10	0	0	0.00E+00	2.16E-08
Dichlorobenzene	0.00E+00	9.67E-07	0	0		
Fluoranthene	1.04E-05	2.42E-09	0	0	6.52E-06	2.92E-06
Fluorene	6.51E-05	2.26E-09	0	0	4.39E-05	4.50E-05
Indeno(1,2,3-cd)pyrene[e]	1.20E-07	1.45E-09	0	0	0.00E+00	2.74E-08
Naphthalene[e]	1.54E-03	4.92E-07	0	0	7.91E-05	7.30E-05
Perylene	1.51E-07	0.00E+00	0	0	1.30E-06	1.28E-06
Phenanthrene	1.30E-04	1.37E-08	0	0	7.83E-05	4.73E-05
Pyrene	9.25E-06	4.03E-09	0	0	1.91E-05	8.76E-06
Non-HAP Organic Compounds						
Acetone[e]	0.00E+00	0.00E+00	0	0	9.77E-04	2.84E-04
Benzaldehyde	0.00E+00	0.00E+00	0	0		
Butane	9.77E-02	1.24E-03	0	0		
Butyraldehyde	0.00E+00	0.00E+00	0	0		
Crotonaldehyde[e]	0.00E+00	0.00E+00	0	0		
Ethylene	1.02E+00	0.00E+00	0	0	1.95E-02	4.31E-03
Heptane	1.37E+00	0.00E+00	0	0		
Hexanal	0.00E+00	0.00E+00	0	0		
Isovaleraldehyde	0.00E+00	0.00E+00	0	0		
2-Methyl-1-pentene	5.83E-01	0.00E+00	0	0		
2-Methyl-2-butene	8.46E-02	0.00E+00	0	0		
3-Methylpentane	2.77E-02	0.00E+00	0	0		
1-Pentene	3.21E-01	0.00E+00	0	0		
n-Pentane	3.06E-02	0.00E+00	0	0		
Valeraldehyde[e]	0.00E+00	0.00E+00	0	0		
Metals						
Antimony[e]	2.63E-05	0.00E+00	0	0		
Arsenic[e]	**9.59E-06**	**1.61E-07**	0	0		
Barium[e]	8.48E-04	2.59E-06	0	0		
Beryllium[e]	**0.00E+00**	**9.67E-09**	0	0		
Cadmium[e]	**7.02E-06**	**8.86E-07**	0	0		
Chromium[e]	8.02E-04	8.24E-07	0	0		
Cobalt[e]	3.79E-06	4.94E-08	0	0		
Copper[e]	4.52E-04	5.00E-07	0	0		
Hexavalent Chromium[e]	**7.71E-06**	**0.00E+00**	0	0		
Manganese[e]	1.12E-03	0.00E+00	0	0		
Mercury[e]	3.50E-05	0.00E+00	0	0		
Molybdenum[e]	0.00E+00	6.47E-07	0	0		
Nickel[e]	**1.08E-03**	**0.00E+00**	0	0		
Phosphorus[e]	4.08E-03	0.00E+00	0	0		
Silver[e]	7.00E-05	0.00E+00	0	0		
Selenium[e]	5.10E-05	0.00E+00	0	0		
Thallium[e]	5.98E-07	0.00E+00	0	0		
Vanadium[e]	0.00E+00	1.35E-06	0	0		
Zinc[e]	8.90E-03	0.00E+00	0	0		

e) IDAPA Toxic Air Pollutant

Criteria Pollutant lb/hr emissions are maximum 1-hr averages

TAPs lb/hr rates are 24-hr averages except for those in bold text. Lb/hr rates for bold TAPs (carcinogens) are annual averages.

Pollutants shown in blue text are emitted only when burning Used Oil, but not when burning #2 Fuel Oil or Natural Gas

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: March 20, 2019

TO: Kelli Wetzel, Permit Writer, Air Program

FROM: Kevin Schilling, Modeling Coordinator, Air Program

PROJECT: P-2016.0006 PROJ 62178, Modification of CDA Redi Mix facility located near Post Falls, Idaho.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
As	Arsenic
ASOS	Automated Surface Observing System
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CBP	Concrete Batch Plant
Cd	Cadmium
CDA	CDA Redi Mix
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
Cr6+	Hexavalent Chromium
DEM	Digital Elevation Map
DEQ	Idaho Department of Environmental Quality
DV	Design Values
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GEP	Good Engineering Practice
HMA	Hot Mix Asphalt
hr	hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
lb/hr	Pounds per hour
m	Meters
m/sec	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum of 1983
NED	National Elevation Dataset
Ni	Nickel
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NWS	National Weather Service
O_3	Ozone

OLM	Ozone Limiting Method
PAH	Polyaromatic Hydrocarbon
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
POM	Polycyclic Organic Matter
ppb	parts per billion
PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
PVMRM	Plume Volume Molar Ratio Method
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
tpy	Tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
°F	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

CDA Redi Mix (CDA) submitted a Permit to Construct (PTC) application for modifications to their existing concrete batch plant (CBP), located near Post Falls, Idaho. Proposed modifications include addition of another CBP and a new hot mix asphalt (HMA) plant. Project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the proposed modification were performed by DEQ to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03). This memorandum provides a summary of impact analysis applicability assessments and a summary of air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

CDA prepared and submitted the PTC application. DEQ used data from the application and other materials obtained from CDA to perform ambient air impact analyses for this project. DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is primarily addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not specifically evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Summary of Submittals and Actions

- February 6, 2019: Regulatory Start Date.
- February 20, 2019: Application determined complete by DEQ.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
General Emission Rates. Emission rates used in the air impact analyses, as listed in this memorandum, must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses.
Operational Rates. The emissions modeled represent the following operational rates: New CBP[a]: ≤100,000 cubic yards (yd^3)/year of concrete ≤1,500 yd^3/day concrete New HMA: ≤150,000 ton/year of asphalt ≤3,500 ton/day of asphalt ≤350 ton/hour of asphalt Existing CBP: 100,000 cubic yards (yd^3)/year of concrete 1,500 yd^3/day concrete	NAAQS/TAPs compliance has not been demonstrated for operational rates greater than those used to generate emissions used in the air impact analyses.
Collocation. Modeling was performed without consideration of any collocated rock crushing plants or additional CBPs or HMAs not considered in this project.	A plant would be considered as collocated if it has emission release points that are within 1,000 feet of the HMA drum dryer stack.
Controls on Existing CBP. The existing CBP was modeled assuming emissions from truck loadout of cement/aggregate are captured and controlled by a baghouse.	Compliance with NAAQS/TAPs has not been demonstrated for uncontrolled emissions from truck loadout.
Air Impact Analyses for Criteria Pollutant Emissions. Facility-wide allowable annual emissions of $PM_{2.5}$[b], PM_{10}[c], and CO do not qualify for a BRC exemption from NAAQS compliance demonstration requirements. Moreover, their short- and long-term emissions are greater than DEQ Level I modeling thresholds. Therefore, these pollutants and averaging times are subject to NAAQS Compliance Demonstration requirements.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutant increases above BRC thresholds, or for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds (where the BRC exclusion cannot be used).
Air Impact Analyses for TAP Emissions. Allowable emissions TAPs other than arsenic (As), Cadmium (Cd), Hexavalent Chromium (Cr6+), Nickel (Ni), Benzene, Formaldehyde, Naphthalene as a Polyaromatic Hydrocarbon (PAH), and Polycyclic Organic Matter (POM) are below screening emission levels (ELs). Modeled impacts of the above-listed TAPs were all below Acceptable Ambient Concentrations of Carcinogens (AACCs) .	A TAP increment compliance demonstration would be required for any TAPs with emissions above ELs.

[a] The submitted permit application requested a throughput of 75,000 yd^3/year. Modeled emissions were based on 100,000 yd^3/year, which is the plant capacity. A lesser throughput will result in decreased emissions and will still assure compliance with applicable standards.

[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

2.0 Background Information

This section provides background information applicable to the project and the facility site. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

The CDA modification project involves adding another CBP and a hot mix asphalt (HMA) plant to the existing CDA facility located near Post Falls, Idaho. Pollutant-emitting processes conducted at the facility will include material handling operations and combustion processes. The PTC addresses all air pollutant-emitting activities associated with the facility other than emissions from mobile sources (tailpipe emissions).

2.2 Proposed Location and Area Classification

The facility is located near Post Falls, within Kootenai County (Northing: 5284900 m; Easting: 497270 m; UTM Zone 11). This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS**. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.** Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAP increments. Idaho Air Rules Section 202.02 states:

> ***02. Estimates of Ambient Concentrations**. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated increases of criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the increase in emissions associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project is typically deemed not to have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1] (in this case, emissions of specific criteria pollutants are exempt from Section 203.02); or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

2.5 *Toxic Air Pollutant Analyses*

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutant (TAP) emissions from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emission increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emission increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the proposed modification were calculated by DEQ using DEQ emission calculation spreadsheets specifically developed for CBPs and HMA plants for various applicable averaging periods. The calculation of potential/allowable emissions is primarily the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Criteria Pollutant Modeling Applicability and Modeled Emission Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.[1]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in most cases where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If total project-specific emission rate increases of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Applicability Thresholds are conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emission sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors.

NAAQS compliance demonstrations were not required for CO, SO_2, NO_2, Pb, nor O_3 (using VOCs as a threshold) for this project since the project qualified for the BRC NAAQS compliance demonstration exemption.

Table 3 provides a comparison between project allowable emissions and BRC levels, and Table 4 provides a comparison between emissions and modeling applicability thresholds for those pollutants not exempt from the requirement to demonstrate NAAQS compliance.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY			
Criteria Pollutant	**BRC Level (ton/year)**	**Applicable Project-Wide PTE Emissions (ton/year)**	**NAAQS Compliance Demonstration Required?**
PM_{10}[a]	1.5	2.0	Yes
$PM_{2.5}$[b]	1.0	1.6	Yes
Carbon Monoxide (CO)	10.0	10.2	Yes
Sulfur Dioxide (SO_2)	4.0	0.3	No
Nitrogen Oxides (NOx)	4.0	2.6	No
Lead (Pb)	0.06	<0.001	No
Volatile Organic Compounds (VOCs)	4.0	2.5	No

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Table 4. SITE-SPECIFIC CRITERIA POLLUTANT MODELING APPLICABILITY					
Pollutant	**Averaging Period**	**Emissions**	**Level I Modeling Thresholds**	**Level II Modeling Thresholds[a]**	**Site-Specific Modeling Required?**
PM_{10}[b]	24-hour	4.4 lb/hr	0.22	2.6	Yes
$PM_{2.5}$[c]	24-hour	3.6 lb/hr	0.054	0.63	Yes
	Annual	1.9 ton/yr	0.35	4.1	Yes
Carbon Monoxide (CO)	1-hour, 8-hour	47 lb/hr	15	175	Yes

[a] Level II Modeling Thresholds were not approved by DEQ for this project.
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Table 5 provides modeled emission rates for the CDA facility for listed averaging periods. Details on the emission calculations are provided in Attachment 1 of this memorandum and in the DEQ Statement of Basis.

3.1.2 Toxic Air Pollutant Modeling Applicability and Modeled Emission Rates

TAP emission regulations under Idaho Air Rules Section 210 are only applicable for new or modified sources constructed after July 1, 1995.

Project emissions of arsenic (As), cadmium (Cd), hexavalent chromium (Cr6+), nickel (Ni), phosphorus (P), formaldehyde, benzene, polycyclic organic matter (POM), and naphthalene as a polyaromatic hydrocarbon (PAH) exceed the applicable emission screening levels (ELs) of Idaho Air Rules Section 585 or 586. Air impact modeling analyses were then required to demonstrate that maximum impacts of those TAPs are below applicable ambient increment standards expressed in Idaho Air Rules Section 585 and 586 as AACs and AACCs.

As, Cd, Cr6+, Ni, formaldehyde, benzene, POM, and PAH are carcinogenic TAPs that are regulated on a long-term averaging basis. Therefore, the appropriate emission rates for impact analyses are maximum annual emissions, expressed as an average pound/hour value over an 8,760-hour period. P is a non-carcinogenic TAP that is regulated on a short-term averaging basis. Therefore, the appropriate emission rates for impact analyses are maximum daily emissions, expressed as an average pound/hour value over a 24-hour period.

Table 5. CRITERIA POLLUTANT EMISSION RATES MODELED					
Source ID	Description	Modeled Emission Rates (lb/hr)[a]			
		1-hour, 8-hour CO	24-hour PM_{10}	24-hour $PM_{2.5}$	Annual $PM_{2.5}$
DRYER	asphalt dryer (HMA)	45.50	3.354	3.252	0.3819
SILOFILL	asphalt silo filling (HMA)	0.4130	0.08544	0.08544	0.01003
LOAD	asphalt loadout (HMA)	0.4722	0.07612	0.07612	0.008937
HOTOIL	asphalt oil heater (HMA)	0.1482	0.01341	0.01341	0.006124
LDCONV	Aggregate handling (HMA)[b,c]		0.5034	0.07622	0.008950
SCREEN	Aggregate screening (HMA)		0.1218	0.001820	2.137E-04
TRCKLOAD	Truck loadout baghouse (CBP)		0.05463	0.02956	0.005400
WEIGHOP	Weigh hopper baghouse (CBP)		0.002470	7.406 E-4	1.353E-04
SILO	Cement silo baghouse (CBP)		0.005216	0.001875	3.425E-04
SUPSILO	Cement supplement silo baghouse (CBP)		0.002553	6.422 E-4	5.137E-04
2MATHAND	Groundlevel sand/aggregate handling (CBP)[c,d]		0.1189	0.03703	0.006764
2BMATHND	Elevated sand/aggregate handling (CBP)[c,e]		0.05944	0.01852	0.003382
1CBP	Enclosed existing CBP[f]		0.1329	0.05350	0.009774
1MATHAND	Existing groundlevel sand/aggregate handling[c,d]		0.1189	0.03703	0.006764
1HEATER	Existing water heater	0.2534	0.01207	0.01207	0.003444

a. Pound/hour emission rate as averaged over the specified period.
b. The source includes fugitive emissions from the handling of aggregate from a frontend loader and three conveyor transfers.
c. Emissions are a function of wind speed and were varied in the model according to the wind speed specified in the meteorological data file.
d. Includes two transfers for sand/aggregate in the vicinity of the groundlevel receiving hopper.
e. Includes one transfer for sand/aggregate transfer to elevated storage.
f. The existing CBP is enclosed in a building. Therefore, emissions from sand/aggregate transfer to elevated storage, weigh hopper loading, truck loadout, cement silo loading, and cement supplement silo loading were modeled as a single volume source.

Table 6 provides a summary of TAP emission increases for the project for those TAPs that had an increase exceeding the ELs of Idaho Air Rules Section 585 or 586. Table 7 lists TAP emission rates used in air impact modeling analyses.

Table 6. TAP EMISSION INCREASES THAT TRIGGER MODELING		
Toxic Air Pollutant	Emissions (lb/hr)[a]	Screening Emissions Level (lb/hr)
Arsenic[b]	1.1 E-5	1.5 E-6
Cadmium[b]	8.6 E-6	3.7 E-6
Hexavalent Chromium (Cr6+)[b]	8.0 E-6	5.6 E-7
Nickle (Ni)[b]	1.1 E-3	2.7 E-5
Formaldehyde[b]	5.5 E-2	5.1 E-4
Benzene[b]	6.8 E-3	8.0 E-4
Polycyclic Organic Matter (POM)[b]	2.9 E-5	2.0 E-6
Naphthalene as a Polyaromatic Hydrocarbon (PAH)[b]	1.7 E-3	9.1 E-5

a. Pounds per hour.
b. Carcinogenic TAP. ELs are annual maximum emissions expressed as pounds/hour. The emissions rate is the annual emissions divided by 8,760 hours/year.

Table 7. TOXIC AIR POLLUTANT EMISSION RATES MODELED									
Source ID	Description	Modeled Emission Rates (lb/hr)[a]							
		As[b]	Cd[c]	Cr6+[d]	Ni[e]	Ben[f]	Form[g]	Naph[h]	POM[i]
DRYER	asphalt dryer (HMA)	9.59E-6	7.02E-6	7.71E-6	1.08E-3	6.68E-3	5.31E-2	1.54E-3	9.38E-6
SILOFILL	asphalt silo filling (HMA)					6.68E-5	1.44E-3	7.91E-5	1.16E-5
LOAD	asphalt loadout (HMA)					3.70E-5	6.27E-5	7.30E-5	7.88E-6
HOTOIL	asphalt oil heater (HMA)		8.86E-7			1.69E-6	6.04E-5	4.92E-7	9.19E-9
TRCKLOAD	Truck loadout baghouse (CBP)	3.93E-7	1.10E-9	7.82E-8	3.83E-7				
SILO	Cement silo baghouse (CBP)	1.19E-8	6.56E-7	1.63E-8	1.17E-7				
SUPSILO	Cement supplement silo baghouse (CBP)	4.17E-7	8.25E-11	1.53E-7	9.50E-7				

a. Pound/hour emission rate as averaged over an annual period of 8,760 hour/year.
b. Arsenic.
c. Cadmium.
d. Hexavalent Chromium.
e. Niclel.
f. Benzene.
g. Formaldehyde.
h. Naphthalene as a polyaromatic hydrocarbon (PAH).
i. Polycyclic Organic Matter.

3.1.3 Emission Release Parameters

Table 8 lists emission release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for emission sources modeled in the air impact analyses. Emission point release parameters were based on information provided by the applicant or DEQ assumptions based on similar sources with a margin of conservatism (less favorable dispersion characteristics such as shorter stack heights, lower flow volumes, etc). Table 9 lists the release parameters for the volume and area sources used in the model.

Table 8. POINT SOURCE STACK PARAMETERS								
Release Point	Description	UTM[a] Coordinates		Stack Height (m)	Stack Flow Temp. (K)[c]	Stack Flow Velocity (m/sec)[d]	Stack Dia. (m)	Orient. of Release[e]
		Easting (m)[b]	Northing (m)					
DRYER	asphalt dryer	497313	5284908	9.14	400	20.2	1.22	vertical
LOAD	asphalt loadout	497308	5284903	3.51	346	0.1	3.0	vertical
SILOFILL	asphalt silo filling	497308	5284903	9	346	0.1	3	vertical
HOTOIL	oil heater	497308	5284913	4.57	366	0.647	0.305	raincap
1HEATER	water heater of existing CBP	497228	5284908	5.33	366	1.796	0.183	raincap
TRCKLOAD	truck loadout baghouse CBP 2	497200	5284894	13.72	0	0.1	0.10	raincap
WEIGHOP	weigh hopper baghouse CBP 2	497200	5284894	6.40	0	2.76	0.198	horiz.
SILO	cement silo CBP 2	497197	5284891	9.75	0	0.1	0.10	raincap
SUPSILO	cement supplement silo CBP 2	497203	5284891	15.54	0	0.1	0.10	vertical

a. Universal Transverse Mercator.
b. Meters.
c. Kelvin.
d. Meters per second.
e. Vertical uninterrupted, rain-capped, or horizontal release.

Table 9. VOLUME AND AREA SOURCE RELEASE PARAMETERS						
Source	Description	UTM[a] Coordinates		Release Height (m)	Horiz. Dim. (m)	Vertical Dim. (m)
		Easting (m)[b]	Northing (m)			
SCREEN	scalping screen	497318	5284913	2.5	0.93	2.33
LDCONV	aggregate loading/conveying	497313	5284908	3.0	7	1.40
1CBP	existing CBP	497232	5284895	7.9	3.54	7.37
1MATHAND	Existing ground-level material handling CBP	497228	5284932	1.80	0.839	1.68
2MATHAND	Ground-level material handling for CBP 2	497195	5284932	1.80	0.839	1.68
2BMATHND	material handling to elevated storage CBP 2	497200	5284897	2.5	1.4	2.33

a. Universal Transverse Mercator.
b. Meters.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. Background design values (DV) for annual and 24-hour $PM_{2.5}$, 24-hour PM_{10}, and 1-hour and 8-hour CO were obtained from the NW-AIRQUEST DV tool (http://lar.wsu.edu/nw-AIRQUEST/lookup.html) using the project site coordinates. These background air pollutant levels are based on regional scale air pollution modeling of pollutants in Washington, Oregon, and Idaho, with modeling results adjusted according to available monitoring data. The values from NW-AIRQUEST are listed in Table 10.

Table 10. DEQ-RECOMMENDED AMBIENT BACKGROUND CONCENTRATIONS		
Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a,b]
$PM_{2.5}$[c]	24-hr	17
	Annual	5.2
PM_{10}[d]	24-hr	75
CO[e]	1-hr	3,250 (2,843 ppb[f])
	8-hr	1835 (1,605 ppb)

a. Micrograms per cubic meter, except where noted otherwise.
b. NW AIRQUEST ambient background lookup tool, 2009-2011.
c. Particulate matter with an aerodynamic diameter of 2.5 microns or less.
d. Particulate matter with an aerodynamic diameter of 10 microns or less.
e. Carbon monoxide.
f. Parts per billion by volume.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by DEQ to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Impact Analyses

DEQ generated the project-specific air pollutant emission inventory and performed air impact analyses based on information submitted by the applicant. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality

standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 11 provides a brief description of parameters used in the modeling analyses.

Table 11. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Post Falls, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 18081.
Meteorological Data	Coeur d'Alene surface data; Spokane upper air data	See Section 3.3.4 of this memorandum for additional details of the meteorological data.
Terrain	Considered	1 arc second National Elevation Dataset (NED) was acquired from the USGS for the surrounding area. AERMAP version 18081 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.5 for more details.
Building Downwash	Considered	Considered in a generic method. See Section 3.3.6.
Receptor Grid	**NAAQS and TAP Analyses** The selection of receptors for use in the Analyses is as follows (see Section 3.3.9):	
	Grid 1	10-meter spacing along the ambient air boundary and out to 50 meters
	Grid 2	25-meter spacing out to 200 meters from the facility boundary
	Grid 3	50-meter spacing out to 1,000 meters from the facility boundary
	Grid 4	100-meter spacing out to 2,000 meters from the facility boundary

3.3.2 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline*[2].

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. The refined, steady-state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 18081 was used by DEQ for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.4 Meteorological Data

DEQ processed a meteorological dataset from Coeur d'Alene, Idaho (KCOE; station ID 727834-24136) covering the years 2012-2016. The upper air soundings required by AERMET were obtained from the Spokane, WA, airport station (site ID 04106). Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on 30 years of Coeur d'Alene airport precipitation data. Conditions were determined to be "wet" for 2012 and 2016, "dry" for 2013 and 2015, and "average" for 2014. Average moisture content is defined as within a 30 percentile of the 30-year mean of 11.2 inches. Calms were somewhat low at 13 percent, and less than 2 percent of the data were missing from the 5-year record. AERMINUTE version 15272 was used to process Automated Surface Observing Systems (ASOS) wind

data for use in AERMET. AERMET version 18081 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The "adjust u star" (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions. DEQ determined that these data are adequately representative of the meteorology at the CDA site for minor source permitting.

3.3.5 Effects of Terrain on Modeled Impacts

Ambient air impact analyses performed by DEQ used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files.

The terrain preprocessor AERMAP version 18081 was used by DEQ to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

3.3.6 Facility Layout and Downwash

DEQ verified proper identification of the site location, equipment locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to plot plans submitted in the application and equipment placement descriptions provided by CDA. Aerial photographs on Google Earth (available at https://www.google.com/earth) were also used to assure that horizontal coordinates were accurate as described in the application.

Potential downwash effects on emission plumes were accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME version 04274) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD.

3.3.7 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." To exclude areas of the site from consideration as ambient air, the permittee must have the legal and practical ability to control access to such areas of the site. CDA provided DEQ with a description of the ambient air boundary and a satellite image plot plan. Areas excluded from ambient air were clearly part of the industrial area used by CDA, as observed in satellite images on Google Earth.

3.3.8 Receptor Network

The receptor grid used in DEQ's analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2] and DEQ determined that it was adequate to resolve maximum modeled impacts.

Table 10 describes the receptor network used in the submitted modeling analyses. The receptor grids used in the model provided good resolution of the maximum design concentrations for the project and

provided extensive coverage for the characteristics of the emission sources modeled. DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.9 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

H = S + 1.5L, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

All sources from the CDA facility are below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

4.0 NAAQS and TAPs Impact Modeling Results

This section provides results for air impact analyses used to demonstrate compliance with applicable criteria pollutants and TAPs.

4.1 Results for NAAQS Analyses

A NAAQS compliance demonstration was only required for PM_{10}, $PM_{2.5}$, and CO, and DEQ elected to perform a cumulative impact analysis for these pollutants rather than perform initial SIL analyses. Table 12 provides results for the cumulative NAAQS impact analysis. For each modeled pollutant, the total impact was calculated by adding the design value (DV) of the modeled impact to the ambient background value. The sum was then compared to the NAAQS. Ambient impacts for the facility, when combined with appropriate ambient backgrounds, were below the NAAQS at all modeled receptors.

Table 12. RESULTS FOR CUMULATIVE NAAQS IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Design Value Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
$PM_{2.5}$[b]	24-hour	15.59	17	32.6	35	93%
	Annual	0.48	5.2	5.68	12	47%
PM_{10}[c]	24-hour	73.85	75	148.9	150	99.3%
CO[d]	1-hour	260	3,250	3,510	40,000	9%
	8-hour	150	1,835	1,985	10,000	20%

a. Micrograms per cubic meter.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Carbon monoxide.

4.2 Results for TAPs Impact Analyses

Dispersion modeling was required to demonstrate compliance with TAP increments listed in Idaho Air Rules Section 585 and 586 for those TAPs with project-wide emission increases exceeding screening emission levels (ELs). Table 13 lists the maximum modeled impacts for specific TAPs. All modeled impacts are below applicable AACs and AACCs.

Table 13. TAP AIR IMPACT ANALYSIS RESULTS

TAP	Maximum Modeled Impact ($\mu g/m^3$)[a,b]	AACC[c] ($\mu g/m^3$)	Percent of AACC
Arsenic (As)	3.25E-6	2.3E-4	1.4
Cadmium (Cd)	1.10E-5	5.6E-4	1.9
Hexavalent Chromium (Cr6+)	2.45E-6	8.3E-5	3.0
Nickel (Ni)	1.14E-4	4.2E-3	2.7
Benzene	1.68E-3	1.2E-1	1.4
Formaldehyde	2.26E-2	7.7E-2	29
Naphthalene as a Polyaromatic Hydrocarbon (PAH)	1.96E-3	1.4E-2	14
Polycyclic Organic Matter (POM)	2.40E-4	3.0E-4	80

a. Micrograms per cubic meter.
b. Carcinogenic TAP. Modeled impact and AACC represent annual or period-average concentration.
c. Acceptable Ambient Concentration of Carcinogen

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ air impact analyses, demonstrated to DEQ's satisfaction that emissions from the CDA facility will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

ATTACHMENT 1

EMISSIONS CALCULATIONS AND MODELING PARAMETERS FOR DEQ'S AIR IMPACT ANALYSES

CBP Modeled Emissions Rates

Aggregate and Sand Handling Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods.

Emissions from aggregate and sand handling were calculated for the following transfers: 1) groundlevel transfers including transfers to a storage pile and transfers to the CBP hopper; 2) transfers to elevated storage.

PM_{10} and $PM_{2.5}$ emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

$$E = k(0.0032)\left[\frac{(U/5)^{1.3}}{(M/2)^{1.4}}\right] \quad \text{lb/ton}$$

Where:

k = 0.35 for PM_{10} and 0.053 for $PM_{2.5}$
M = moisture content % by weight of material: 1.77% for aggregate and 4.17% for sand
U = wind speed (mph)

In the model, emissions are varied as a function of windspeed, with the base emissions entered for a windspeed of 10 mph.

upper windspeeds for 6 categories: 1.54, 3.09, 5.14, 8.23, 10.8 m/sec

Median windspeed for each category (1 m/sec = 2.237 mph)

Cat 1: (0 + 1.54)/2 = 0.77 m/sec ➢ 1.72 mph
Cat 2: (1.54 + 3.09)/2 = 2.32 m/sec ➢ 5.18 mph
Cat 3: (3.09 + 5.14)/2 = 4.12 m/sec ➢ 9.20 mph
Cat 4: (5.14 + 8.23)/2 = 6.69 m/sec ➢ 14.95 mph
Cat 5: (8.23 + 10.8)/2 = 9.52 m/sec ➢ 21.28 mph
Cat 6: (10.8 + 14)/2 = 12.4 m/sec ➢ 27.74 mph

Base $PM_{2.5}$ factor for aggregate – use 10 mph wind:

$$0.053\,(0.0032)\frac{(10/5)^{1.3}}{(1.77/2)^{1.4}} = 4.955\ E-3 \quad \text{lb/ton}$$

PM_{10} emissions were calculated in the same manner but are not presented here.

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (2.012 E-4) = 5.026 E-5 lb/ton
Factor = 5.026 E-5 / 4.955 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (2.012 E-4) = 2.107 E-4 lb/ton
Factor = 2.107 E-4 / 4.955 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (2.012 E-4) = 4.446 E-4 lb/ton
Factor = 4.446 E-4 / 4.955 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (2.012 E-4) = 8.358 E-4 lb/ton
Factor = 8.358 E-4 / 4.955 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (2.012 E-4) = 1.323 E-3 lb/ton
Factor = 1.323 E-3 / 4.955 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (2.012 E-4) = 1.867 E-3 lb/ton
Factor = 1.867 E-3 / 4.955 E-4 = 3.768

1 yd^3 of concrete ≈ 4024 lbs, consisting of:
1865 lbs aggregate
1428 lbs sand
491 lbs cement
73 lbs supplement
20 gal of water

Fraction of aggregate = 1865 lb / 4024 lb = 0.4635

Base $PM_{2.5}$ factor for aggregate in terms of lb/yd^3

$$\frac{4.955\text{ E-4 lb } PM_{2.5}}{\text{ton}} \left| \frac{0.4635\text{ ton agg}}{\text{ton concrete}} \right| \frac{\text{ton}}{2{,}000\text{ lb}} \left| \frac{4{,}024\text{ lb conc.}}{yd^3} \right. = \frac{4.621\text{ E-4 lb } PM_{2.5}}{yd^3}$$

Assume moderate fugitive dust controls reduce emissions by an additional 75%.
Base controlled PM_{10} factor in terms of lb/yd^3

$$\frac{4.621\text{ E-4 lb } PM_{2.5}}{yd^3} \left| \frac{(1-0.75)}{} \right. = \frac{1.155\text{ E-4 lb } PM_{2.5}}{yd^3}$$

Using the same process for sand handling (using a moisture content of 4.17% for sand in the emission equation), the $PM_{2.5}$ controlled emissions factor is 2.665 E-5 lb $PM_{2.5}/yd^3$

There are two groundlevel transfers of aggregate and sand: 1) transfer to a storage pile; 2) transfer from a pile to the hopper.

For the operational scenario for 1,500 cy/day concrete and 100,000 cy/year concrete, $PM_{2.5}$ emissions from aggregate and sand transfers at groundlevel are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \left| \frac{2\text{ transfers}}{} \right| \frac{1{,}500\ yd^3}{\text{day}} \left| \frac{\text{day}}{24\text{ hr}} \right. = \frac{0.01777\text{ lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{yd^3\text{ - transfer}} \left| \frac{2\text{ transfers}}{} \right| \frac{100{,}000\ yd^3}{\text{yr}} \left| \frac{\text{yr}}{8760\text{ hr}} \right. = \frac{0.003245\text{ lb } PM_{2.5}}{\text{hr}}$$

CDA indicated that groundlevel aggregate hopper is 11.83 ft high (3.606 m). These sources were modeled as a single volume source. The release height was set at half the height of the hopper at 1.803 m. Emissions were modeled over a square area with horizontal dimensions equal to the height of the hopper. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 3.606 m / 4.3 = 0.839 m

σ_{zo} = 3.606 m / 2.15 = 1.677 m

There is one elevated transfer of aggregate and sand: 1) transfer to elevated storage bin.

For the operational scenario for 1,500 cy/day concrete and 100,000 cy/year concrete, emissions from aggregate and sand transfers to elevated storage are as follows:

Daily $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-3 lb}}{\text{yd}^3\text{ - transfer}} \left| \frac{1\text{ transfers}}{} \right| \frac{1{,}500\text{ yd}^3}{\text{day}} \left| \frac{\text{day}}{24\text{ hr}} \right. = \frac{0.008884\text{ lb } PM_{2.5}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{1.155\text{ E-4 lb} + 2.665\text{ E-5 lb}}{\text{yd}^3\text{ - transfer}} \left| \frac{1\text{ transfers}}{} \right| \frac{100{,}000\text{ yd}^3}{\text{yr}} \left| \frac{\text{year}}{8760\text{ hr}} \right. = \frac{0.001623\text{ lb } PM_{2.5}}{\text{hr}}$$

These sources were modeled as a single volume source on or adjacent to a 6-meter square building, 5.0 meters high, with a release height of 2.5 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 6 m / 4.3 = 1.40 m

σ_{zo} = 5.0 m / 2.15 = 2.33 m

Cement and Supplement Silo Filling Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods. Emissions are controlled by a baghouse.

Stack parameters for the cement and supplement silo of the proposed CBP were provided in the submitted application. DEQ conservatively modeled the release as raincapped and at 0.0 Kelvin to eliminate momentum and buoyancy flux. The stack diameter and flow velocity were set at 0.1 m/sec as a placeholder.

Weigh Hopper Loading Baghouse Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods. Emissions are controlled by a baghouse.

Stack parameters for the weigh hopper loading baghouse of the proposed CBP were provided in the submitted application. DEQ conservatively modeled the release as horizontal and at 0.0 Kelvin to eliminate momentum and buoyancy flux. The system flow rate of 180 acfm and release area of 0.67 ft^2

(resulting from two slots of 11/16 in X 48 in and two slots of 5/8 in X 30 in), gives an effective diameter of 0.20 m and a flow velocity of 2.76 m/sec.

Truck Loadout Baghouse Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods. Emissions from mixer truck loading are captured by a chute that attaches to the mixer truck and a high velocity suction to convey emissions to a baghouse.

Stack parameters for the truck loadout baghouse of the proposed CBP were provided in the submitted application. DEQ conservatively modeled the release as capped release and at 0.0 Kelvin to eliminate momentum and buoyancy flux. The submitted system flow rate of 5,880 acfm and release diameter of 5.93 in (0.149 m) results in a unrealistic stack flow velocity of 520 m/sec. Although momentum and buoyancy flux are nullified by the combination of a capped release and release at ambient temperature, DEQ used a stack diameter of 0.1 m and a flow velocity of 0.1 m/sec as a placeholder.

Existing Enclosed Concrete Batch Plant Emissions

Enclosed Batch Plant Operation Emissions

Most emission sources associated with the existing CBP are enclosed in a structure. During concrete loadout to a truck, a bay door is opened and the mixer truck is backed into the building and connected to the loadout chute. The door remains open during loadout.

The sources enclosed in the structure include: sand/aggregate transfer to elevated storage; cement and cement supplement silo loading; weigh hopper loading; and truck loadout. A DEQ-developed CBP spreadsheet was used to calculate emissions rates for specific operations for various averaging periods. The emissions from specific operations were summed together and modeled as a single volume source. No additional emission control was credited for the structure because a bay door remains open during operations.

The building encloser is 80 ft x 50 ft x 52 ft high (24.3 m x 15.2 m x 15.8 m).

The initial dispersion coefficients were calculated as follows:

σ_{yo} = 15.2 m / 4.3 = 3.54 m

σ_{zo} = 15.8 m / 2.15 = 7.37 m

Aggregate and Sand Handling Emissions at Groundlevel

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods. These fugitive emissions were calculated and modeled identically to those for the new proposed CBP.

Water Heater Emissions

A DEQ-developed CBP spreadsheet was used to calculate emissions rates for various averaging periods.

CDA provided DEQ with a stack height of 17.5 ft (5.33 m) and 0.6 ft (0.186 m) diameter for the existing water heater. DEQ used a conservatively used a stack release temperature of 200 °F (366 K) and a flow of 100 acfm, giving a stack velocity of 1.80 m/sec. The source was modeled as a capped release, negating momentum flux.

HMA Plant Modeled Emissions Rates

Drum Dryer Emissions

A DEQ-developed HMA spreadsheet was used to calculate emissions rates for various averaging periods.

Asphalt Silo Filling and Loadout

The DEQ HMA plant emissions calculation spreadsheet was used to generate emissions quantities for applicable averaging periods.

DEQ modeled silo filling as a point source:

- Release height of 9 meters (estimated height of typical silo)
- Stack diameter of 3 meters (approximate diameter of silo)
- Release temperature was estimated at ½ the AP42 default asphalt temperature: 325 °F / 2 = 163 °F.
- Stack velocity of 0.1 m/sec to account for convective air flow.

DEQ modeled asphalt loadout as a point source:

- Release height of 3.5 meters (estimated height at top of truck bed)
- Stack diameter of 3 meters (approximate diameter of silo)
- Release temperature was estimated at ½ the AP42 default asphalt temperature: 325 °F / 2 = 163 °F.
- Stack velocity of 0.1 m/sec to account for convective air flow.

Asphalt Tank Heater Emissions

The DEQ HMA plant emissions calculation spreadsheet estimated emissions from the asphalt oil heater based on 8 hour/day and 4000 hour/year operation, using a 1.8 MMBtu/hour natural gas heater.

Power Generator

No stationary internal combustion engines will be operated at the facility.

Aggregate Handling Emissions

Emissions from aggregate handling were calculated for the following transfers: 1) aggregate to a storage pile by frontend loader; 2) aggregate from a pile to a hopper by frontend loader; 3) three conveyor transfers.

PM_{10} and $PM_{2.5}$ emissions associated with the handling of aggregate materials were calculated using emissions factors from AP42 Section 13.2.4.

Emissions were calculated using the following emissions equation:

$$E = k(0.0032)\left[\frac{(U/5)^{1.3}}{(M/2)^{1.4}}\right] \quad \text{lb/ton}$$

Where:

k = 0.053 for $PM_{2.5}$, 0.35 for PM_{10}
M = 3% for aggregate
U = wind speed (mph)

A moisture content of 3% to 7% was estimated as a typical moisture content of aggregate entering the dryer, per STAPPA-ALAPCO-EPA, Emission Inventory Improvement Program, Volume II, Chapter 3, Preferred and Alternative Methods for Estimating Air Emissions from Hot Mix Asphalt Plants, Final Report, July 1996. The lower level of moisture combined with an additional 90% emissions control was applied to calculated emissions from the conveyor transfers to account for additional emissions control measures required by Idaho regulations and the permit.

In the model, emissions are varied as a function of windspeed, with the base emissions entered for a windspeed of 10 mph. This is the same method as was used for sand/aggregate handling for the CBP.

upper windspeeds for 6 categories: 1.54, 3.09, 5.14, 8.23, 10.8 m/sec

Median windspeed for each category (1 m/sec = 2.237 mph)

Cat 1: (0 + 1.54)/2 = 0.77 m/sec ➢ 1.72 mph
Cat 2: (1.54 + 3.09)/2 = 2.32 m/sec ➢ 5.18 mph
Cat 3: (3.09 + 5.14)/2 = 4.12 m/sec ➢ 9.20 mph
Cat 4: (5.14 + 8.23)/2 = 6.69 m/sec ➢ 14.95 mph
Cat 5: (8.23 + 10.8)/2 = 9.52 m/sec ➢ 21.28 mph
Cat 6: (10.8 + 14)/2 = 12.4 m/sec ➢ 27.74 mph

Base $PM_{2.5}$ factor – use 10 mph wind:

$$0.053(0.0032)\frac{(10/5)^{1.3}}{(3/2)^{1.4}} = 2.367\ \text{E-4}\quad \text{lb/ton}$$

Adjustment factors to put in the model:

Cat 1: $(1.72/5)^{1.3}$ (9.614 E-5) = 2.401 E-5 lb/ton
Factor = 2.401 E-5/2.367 E-4 = 0.1014

Cat 2: $(5.18/5)^{1.3}$ (9.614 E-5) = 1.007 E-4 lb/ton
Factor = 1.007 E-4 /2.367 E-4 = 0.4253

Cat 3: $(9.20/5)^{1.3}$ (9.614 E-5) = 2.124 E-4 lb/ton
Factor = 2.124 E-4/2.367 E-4 = 0.8974

Cat 4: $(14.95/5)^{1.3}$ (9.614 E-5) = 3.993 E-4 lb/ton
Factor = 3.993 E-4/2.367 E-4 = 1.687

Cat 5: $(21.28/5)^{1.3}$ (9.614 E-5) = 6.318 E-4 lb/ton
Factor = 6.318 E-4/2.367 E-4 = 2.669

Cat 6: $(27.74/5)^{1.3}$ (9.614 E-5) = 8.918 E-4 lb/ton
Factor = 8.918 E-4/2.367 E-4 = 3.768

For the operational scenario for 3,360 ton/day HMA and 144,000 ton/year HMA, emissions from the loader are as follows (daily and annual throughputs were based on aggregate being 96% of the total HMA production):

Daily $PM_{2.5}$:

$$\frac{2.367\text{ E-4 lb } PM_{2.5}}{\text{ton}} \left| \frac{3{,}360\text{ ton}}{\text{day}} \right| \frac{\text{day}}{24\text{ hr}} \left| \frac{2\text{ transfers}}{} \right. = \frac{0.06628\text{ lb}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{2.367\text{ E-4 lb } PM_{2.5}}{\text{ton}} \left| \frac{144{,}000\text{ ton}}{\text{yr}} \right| \frac{\text{yr}}{8{,}760\text{ hr}} \left| \frac{2\text{ transfers}}{} \right. = \frac{0.007782\text{ lb}}{\text{hr}}$$

Emissions from the three conveyor transfers are as follows:

Daily $PM_{2.5}$:

$$\frac{2.367\text{ E-4 lb } PM_{2.5}}{\text{ton}} \left| \frac{3{,}360\text{ ton}}{\text{day}} \right| \frac{\text{day}}{24\text{ hr}} \left| \frac{3\text{ transfers}}{} \right| \frac{(1\text{-}0.90)}{} = \frac{0.009941\text{ lb}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{2.367\text{ E-4 lb } PM_{2.5}}{\text{ton}} \left| \frac{144{,}000\text{ ton}}{\text{yr}} \right| \frac{\text{yr}}{8{,}760\text{ hr}} \left| \frac{3\text{ transfers}}{} \right| \frac{(1\text{-}0.90)}{} = \frac{0.001167\text{ lb}}{\text{hr}}$$

Total aggregate handling emissions:

Daily $PM_{2.5}$: 0.06628 lb/hr + 0.009941 lb/hr = 0.07622 lb/hr
Annual $PM_{2.5}$: 0.007782 lb/hr + 0.001167 lb/hr = 0.008949 lb/hr

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

These sources were modeled as a single volume source with a 30-meter square area, 6.0 meters thick, with a release height of 3.0 meters. The initial dispersion coefficients were calculated as follows:

σ_{yo} = 30 m / 4.3 = 7.0 m

σ_{zo} = 6 m / 4.3 = 1.40 m

Screening Emissions

This HMA plant uses one scalping screen. A $PM_{2.5}$ factor for uncontrolled emissions was not available in AP42. A $PM_{2.5}$ factor was estimated by DEQ permit writers and entered into the HMA calculation spreadsheet. The uncontrolled emissions factor was used and a 90% reduction applied to calculated emissions to account for additional emissions control measures required by Idaho regulations and the permit.

Daily and annual throughputs were based on aggregate being 96% of the total HMA production.

For the operational scenario for 5,000 ton/day HMA and 300,000 ton/year HMA, emissions are as follows:

Scalping Screen (controlled emissions):

Daily $PM_{2.5}$:

$$\frac{0.000130 \text{ lb } PM_{2.5}}{\text{ton}} \left| \frac{3{,}360 \text{ ton}}{\text{day}} \right| \frac{\text{day}}{24 \text{ hr}} \left| (1\text{-}0.90) \right. = \frac{0.001820 \text{ lb}}{\text{hr}}$$

Annual $PM_{2.5}$:

$$\frac{0.000130 \text{ lb } PM_{2.5}}{\text{ton}} \left| \frac{144{,}000 \text{ ton}}{\text{yr}} \right| \frac{\text{yr}}{8{,}760 \text{ hr}} \left| (1\text{-}0.90) \right. = \frac{0.0002137 \text{ lb}}{\text{hr}}$$

This source was modeled as a single volume source on or adjacent to a structure 5 m X 4 m, 5.0 meters thick, with a release height of 3.0 meters. The initial dispersion coefficients are calculated as follows:

σ_{yo} = 3 m / 4.3 = 0.70 m
σ_{zo} = 3 m / 4.3 = 0.70 m

References

1. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses*. Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

3. *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard.* Office of Air Quality Planning and Standards. Air Quality Modeling Group. Research Triangle Park, NC. Guidance memorandum from R. Chris Owen and Roger Brode to Regional Dispersion Modeling Contacts. September 30, 2014.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on April 1, 2019:

Facility Comment: On page 6 of the Modeling Review document that the operational rates for concrete to be produced from the new and existing CBP say 1500 yd3/ year when I believe they should say yd3/day.

DEQ Response: The correction has been made to the Modeling Review Memorandum.

Facility Comment: Section 2.6 of the draft PTC appears to be an exact duplicate of section 2.5. I'm assuming that was just an oversight.

DEQ Response: The duplicate permit condition has been removed.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company:	**CD'A Redi Mix**
Address:	**6399 W Bedrock Rd**
City:	**Post Falls**
State:	**Idaho**
Zip Code:	**83854**
Facility Contact:	**Robert Moore**
Title:	**Sales Representative**
AIRS No.:	**055-00125**

N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y Did this permit require engineering analysis? Y/N

N Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	2.0	0	2.0
SO_2	0.2	0	0.2
CO	10.1	0	10.1
PM10	2.3	0	2.3
VOC	2.7	0	2.7
Total:	17.4	0	**17.4**
Fee Due	**$ 5,000.00**		

Comments: